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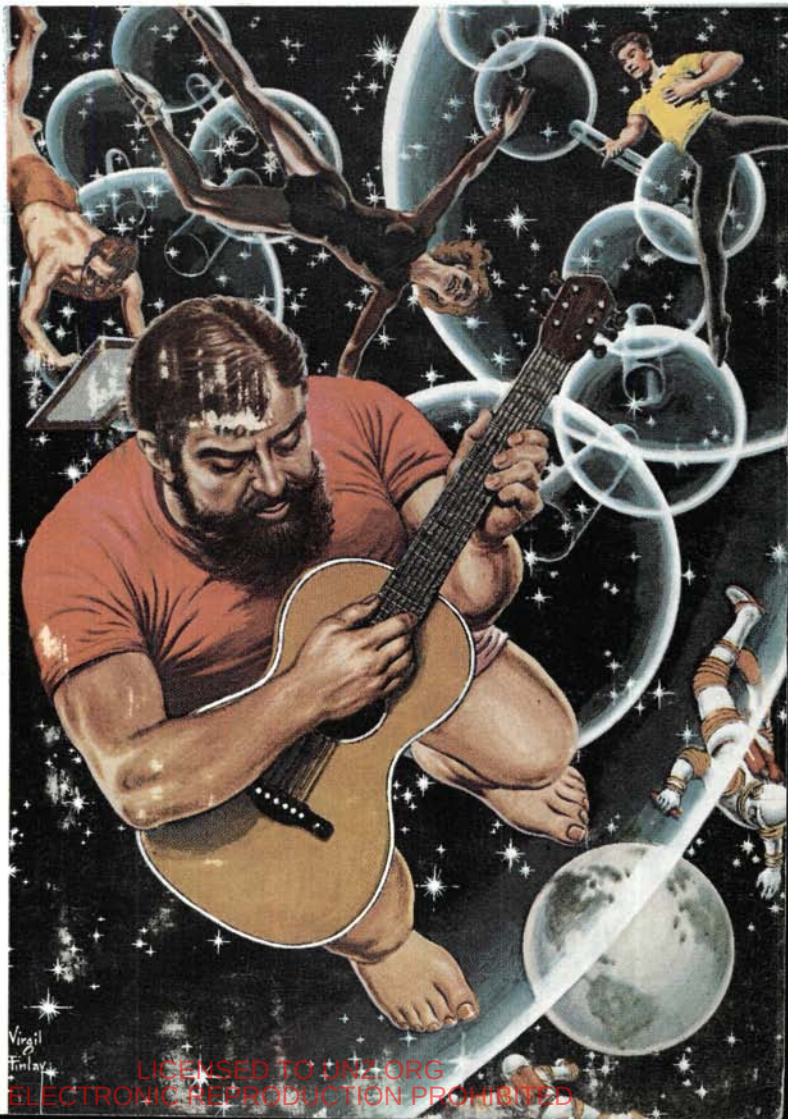
BY JACK SHARKEY

THE BEAT CLUSTER
BY FRITZ LEIBER



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MAGAZINE

CONTENTS

NOVELLAS

A PLANT NAMED SHAYOL ..... *by Cordwainer Smith* 8
ARCTURUS TIMES THREE ..... *by Jack Sharkey* 122

NOVELETTES

THE ABOMINABLE EARTHMAN ..... *by Frederik Pohl* 68
THE SPY IN THE ELEVATOR ..... *by Donald E. Westlake* 178

SHORT STORIES

CRIME MACHINE ..... *by Robert Bloch* 47
AMATEUR IN CHANCERY ..... *by George O. Smith* 54
MATING CALL ..... *by Frank Herbert* 107
THE BEAT CLUSTER ..... *by Fritz Leiber* 158

SCIENCE DEPARTMENT

FOR YOUR INFORMATION ..... *by Willy Ley* 92
The Man Made Land

FEATURES

HOW MUCH IS ENOUGH? 5
FORECAST 172
GALAXY'S FIVE STAR SHELF ..... *by Floyd C. Gale* 173

Cover by FINLAY, illustrating The Beat Cluster

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HOW MUCH IS ENOUGH?

LET's think about education for a while. How much do we need? And what do we need it for?

By the age of thirteen or fourteen a child is supposed to have learned a few simple arts and skills—the rudiments of geography, as much simple arithmetic as he will ever need and a beginning in algebra; English, grammar and spelling sufficient to write a letter or read a mass-circulation magazine; and a smattering of other odds and ends.

At eighteen, leaving high school, he will have added a half-baked acquaintance with the less useful forms of another language; and a few excursions into geometry and intermediate algebra. He will perform experiments involving most of the simpler discoveries of 19th century science. He will have tasted the less controversial delights of literature, and memorized enough historical dates to understand, at least, what the major holidays commemorate.

Four college years later, his bachelor's degree in his hand, he will be presumed to have "completed" his education . . . in every respect save one.

If he is to be a chemist, he will have learned as much about French essays as he will ever be required to know.

If he is to be a teacher of social studies, he will have completed his learning of mathematics.

He will, in short, have learned all he needs to know—about every subject about which he really *needs* to know nothing. It is in the next two, four or ten years—whether in school or serving his apprenticeship outside of school—that he will at last learn *his own work.*

It is in this "post graduate" period that the chemist learns chemistry and the social studies teacher learns what the Lynds were up to when they wrote *Middletown.*

In any branch of learning, then, in which a body of knowledge already exists, the practitioner is in his thirties before he really knows what can be taught him. And what *can* be "taught"? He knows what Michelson did in 1887. But he doesn't know what Fred Hoyle is doing in 1961. He knows what Galileo deduced about gravitation and mass in 1591, but he doesn't know what some isolated

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worker has just learned *this week*. Only dead knowledge is entombed in texts. For what is going on now, where the work is to be done, only day-by-day continuing study can keep a man abreast of his own field.

IT is a two-headed problem, you see.

Head one: Too much time is spent learning what isn't needed. (Not needed the job, anyway. Naturally the more everyone knows about everything, the more understanding we'll have in the world. The question is really how much of a price we are willing to pay to have a "well-rounded" population.)

Head two: There is too much information in every area for any one person to digest.

There is a solution at least to the problem propounded by the second head. Algis Budrys once wrote a story in which people kept their memories in little computer-storage boxes which they carried around with them. Want to know Uncle Charlie's birthday? Plug in the appropriate area of the little black box, and the stored information comes promptly to mind.

Well, the story is fiction, of course. We don't have any such little black box on the market.

Do we?

What Budrys was suggesting was an idea, not a box. Maybe, after all, we're not so far from the idea. Data is now being made available in highly compressed form. 10,000 pages of French atomic-energy data is to be had by anyone with the price in the form of a batch of microcards not much larger than a canasta deck. They can be flicked out by sorters without much difficulty by simple edge-coding. You don't read French? No problem. Machine translation of foreign languages is already a practical reality. (An awkward, unpolished, idiosyncratic reality— *"Le chat est noir"* is likely to come out "The/this cat-masculine (is?) black/blackly"—but a reality all the same.)

It is a question of accessibility. The most accessible place for information is right in the front of *your own brain*—"at the tip of your fingers," as we say—but surely an acceptable second-best would be to have it *really* "at the tips of your fingers"—i.e., at the other end of a computerized teletype setup.

It would be a pretty big box to carry around, but it can be built: A computer, linked with sufficient storage capacity (which doesn't have to be in one place; International Tel & Tel will gladly give you a circuit from almost anywhere to almost everywhere), so that the man working on the angular momentum of galaxies in

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Pasadena can get the latest spectroscopic data from France, England, Australia and Capetown simply by pushing the combination of buttons that translates as: "Galaxies, spectroscopic, internal Doppler shifts of."

AND what about the other head of the problem? What about the task of merely acquiring a basis of embalmed knowledge—i.e., "education?"

There's no doubt, as we said, that knowledge is a desideratum. But there are kinds and kinds of knowledge. It isn't going to help a layman (won't for that matter even help a mathematician particularly!) to know that the six millionth prime number is 104,395,289. Surely it is enough for him to know a few simple rules: that the distribution of primes is such that in the first hundred million integers about one out of twenty is a prime; or to know, if a number like 104,395,281 comes up, that it is *not* a prime. (All he has to know is the simple rule that if the sum of the digits in a number is divisible by three, the number itself is divisible by three, and thus by definition not a prime.)

By the same token, it isn't particularly important to memorize the date of the Battle of New Orleans or the signing of the Emancipation Proclamation. The sequence of events surrounding each of these occasions may be worth remembering: for New Orleans, because it occurred after the War of 1812, of which it was a part, was actually over (the Treaty of Ghent had been signed, but the combatants didn't know about it); for the Emancipation Proclamation, because its timing offers an interesting and useful glimpse into the thinking of one of our greatest presidents (it waited on the Union victory at Antietam, because Lincoln, a master politician, held it up until a Northern victory would give it extra meaning.)

Actually, a good answer to most school test questions would be: "I can look it up for you, if you want me to." Unfortunately, that's not a passing answer!

But perhaps it isn't the answer that's wrong; perhaps it's the system of examining on details instead of on understanding.

What's the answer to the problem of education? Well, it's not the business of a science-fiction magazine to say. We supply questions, not answers. Hugo Gernsback says that that's the hard part of the creative process: It's easy to work out the answers, once the questions are known.

Well, let's work on these for a while!

—THE EDITOR

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A PLANET NAMED

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He had committed the most dreadful of crimes — but what sort of punishment was this, when even his jailers pitied him?

SHAYOL

Illustrated by FINLAY

By CORDWAINER SMITH

THERE was a tremendous difference between the liner and the ferry in Mercer's treatment. On the liner, the attendants made gibes when they brought him his food.

"Scream good and loud," said one rat-faced steward, "and then we'll know it's you when they broadcast the sounds of punishment on the Emperor's birthday."

The other, fat steward ran the tip of his wet red tongue over his thick purple-red lips one time and said, "Stands to reason, man. If you hurt all the time, the whole lot of you would die. Something pretty good must happen, along with the — whatchamacallit. Maybe you turn in-

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to a woman. Maybe you turn into two people. Listen, cousin, if it's real crazy fun, let me know. . . ." Mercer said nothing. Mercer had enough troubles of his own not to wonder about the daydreams of nasty men.

At the ferry it was different. The biopharmaceutical staff was deft, impersonal, quick in removing his shackles. They took off all his prison clothes and left them on the liner. When he boarded the ferry, naked, they looked him over as if he were a rare plant or a body on the operating table. They were almost kind in the clinical deftness of their touch. They did not treat him as a criminal, but as a specimen.

Men and women, clad in their medical smocks, they looked at him as though he were already dead.

He tried to speak. A man, older and more authoritative than the others, said firmly and clearly, "Do not worry about talking. I will talk to you myself in a very little time. What we are having now are the preliminaries, to determine your physical condition. Turn around, please."

Mercer turned around. An orderly rubbed his back with a very strong antiseptic.

"This is going to sting," said one of the technicians, "but it is nothing serious or painful. We are determining the toughness of the different layers of your skin."

Mercer, annoyed by this impersonal approach, spoke up just as a sharp little sting burned him above the sixth lumbar vertebra. "Don't you know who I 'am?"

"Of course we know who you are," said a woman's voice. "We have it all in a file in the corner. The chief doctor will talk about your crime later, if you want to talk about it. Keep quiet now. We are making a skin test, and you will feel much better if you do not make us prolong it."

Honesty forced her to add another sentence: "And we will get better results as well."

They had lost no time at all in getting to work.

He peered at them sidewise to look at them. There was nothing about them to indicate that they were human devils in the antechambers of hell itself. Nothing was there to indicate that this was the satellite of Shayol, the final and uttermost place of chastisement and shame. They looked like medical people from his life before he committed the crime without a name.

They changed from one routine to another. A woman, wearing a surgical mask, waved her hand at a white table.

"Climb up on that, please."

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No one had said "please" to Mercer since the guards had seized him at the edge of the palace. He started to obey her and then he saw that there were padded handcuffs at the head of the table. He stopped.

"Get along, please," she demanded. Two or three of the others turned around to look at both of them.

The second "please" shook him. He had to speak. These were people, and he was a person again. He felt his voice rising, almost cracking into shrillness as he asked her, "Please ma'am, is the punishment going to begin?"

"THERE'S no punishment here," said the woman. "This is the satellite. Get on the table. We're going to give you your first skin-toughening before you talk to the head doctor. Then you can tell him all about your crime —"

"You know my crime?" he said, greeting it almost like a neighbor.

"Of course not," said she, "but all the people who come through here are believed to have committed crimes. Somebody thinks so or they wouldn't be here. Most of them want to talk about their personal crimes. But don't slow me down. I'm a skin technician, and down on the surface of Shayol you're going to need the very best work that any of us can do for you. Now get on that table. And when you are ready to talk to the chief you'll have something to talk about beside your crime."

He complied.

Another masked person, probably a girl, took his hands in cool, gentle fingers and fitted them to the padded cuffs in a way he had never sensed before. By now he thought he knew every interrogation machine in the whole empire, but this was nothing like any of them.

The orderly stepped back. "All clear, sir and doctor."

"Which do you prefer?" said the skin technician. "A great deal of pain or a couple of hour's unconsciousness?"

"Why should I want pain?" said Mercer.

"Some specimens do," said the technician, "by the time they arrive here. I suppose it depends on what people have done to them before they got here. I take it you did not get any of the dream-punishments."

"No," said Mercer. "I missed those." He thought to himself, I didn't know that I missed anything at all.

He remembered his last trial, himself wired and plugged in to the witness stand. The room had been high and dark. Bright blue

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light shone on the panel of judges, their judicial caps a fantastic parody of the episcopal mitres of long, long ago. The judges were talking, but he could not hear them. Momentarily the insulation slipped and he heard one of them say, "Look at that white, devilish face. A man like that is guilty of everything. I vote for Pain Terminal." "Not Planet Shayol?" said a second voice. "The dromozoa place," said a third voice. "That should suit him," said the first voice. One of the judicial engineers must then have noticed that the prisoner was listening illegally. He was cut off. Mercer then thought that he had gone through everything which the cruelty and intelligence of mankind could devise.

But this woman said he had missed the dream-punishments. Could there be people in the universe even worse off than himself? There must be a lot of people down on Shayol. They never came back.

He was going to be one of them; would they boast to him of what they had done, before they were made to come to this place?

"You asked for it," said the woman technician. "It is just an ordinary anesthetic. Don't panic when you awaken. Your skin is going to be thickened and strengthened chemically and biologically."

"Does it hurt?"

"Of course," said she. "But get this out of your head. We're not punishing you. The pain here is just ordinary medical pain. Anybody might get it if they needed a lot of surgery. The punishment, if that's what you want to call it, is down on Shayol. Our only job is to make sure that you are fit to survive after you are landed. In a way, we are saving your life ahead of time. You can be grateful for that if you want to be. Meanwhile, you will save yourself a lot of trouble if you realize that your nerve endings will all respond to the change in the skin. You had better expect to be very uncomfortable when you recover. But then, we can help that, too." She brought down an enormous lever and Mercer blacked out.

WHEN he came to, he was in an ordinary hospital room, but he did not notice it. He seemed bedded in fire. He lifted his hand to see if there were flames on it. It looked the way it always had, except that it was a little red and a little swollen. He tried to turn in the bed. The fire became a scorching blast which stopped him in mid-turn. Uncontrollably, he moaned.

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A voice spoke, "You are ready for some pain-killer."

It was a girl nurse. "Hold your head still," she said, "and I will give you half an amp of pleasure. Your skin won't bother you then."

She slipped a soft cap on his head. It looked like metal but it felt like silk.

He had to dig his fingernails into his palms to keep from threshing about on the bed.

"Scream if you want to," she said. "A lot of them do. It will just be a minute or two before the cap finds the right lobe in your brain."

She stepped to the corner and did something which he could not see.

There was the flick of a switch.

The fire did not vanish from his skin. He still felt it; but suddenly it did not matter. His mind was full of delicious pleasure which throbbed outward from his head and seemed to pulse down through his nerves. He had visited the pleasure palaces, but he had never felt anything like this before.

He wanted to thank the girl, and he twisted around in the bed to see her. He could feel his whole body flash with pain as he did so, but the pain was far away. And the pulsating pleasure which coursed out of his head, down his spinal cord and into his nerves was so intense that the pain got through only as a remote, unimportant signal.

She was standing very still in the corner.

"Thank you, nurse," said he.

She said nothing.

He looked more closely, though it was hard to look while enormous pleasure pulsed through his body like a symphony written in nerve-messages. He focused his eyes on her and saw that she too wore a soft metallic cap.

He pointed at it.

She blushed all the way down to her throat.

She spoke dreamily, "You looked like a nice man to me. I didn't think you'd tell on me. . ."

He gave her what he thought was a friendly smile, but with the pain in his skin and the pleasure bursting out of his head, he really had no idea of what his actual expression might be. "It's against the law," he said. "It's terribly against the law. But it is nice."

"How do you think *we* stand it here?" said the nurse. "You specimens come in here talking like ordinary people and then you go down to Shayol. Terrible things happen to you on Shayol. Then the surface station sends up parts of you, over and over

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again. I may see your head ten times, quick-frozen and ready for cutting up, before my two years are up. You prisoners ought to know how we suffer," she crooned, the pleasure-charge still keeping her relaxed and happy, "you ought to die as soon as you get down there and not pester us with your torments. We can hear you screaming, you know. You keep on sounding like people even after Shayol begins to work on you. Why do you do it, Mr. Specimen?" She giggled sillily. "You hurt our feelings so. No wonder a girl like me has to have a little jolt now and then. It's real, real dreamy and I don't mind getting you ready to go down on Shayol." She staggered over to his bed. "Pull this cap off me, will you? I haven't got enough will power left to raise my hands."

MERCER saw his hand tremble as he reached for the cap.

His fingers touched the girl's soft hair through the cap. As he tried to get his thumb under the edge of the cap, in order to pull it off, he realized that this was the loveliest girl he had ever touched. He felt that he had always loved her, that he always would. He cap came off. She stood erect, staggering a little before she found a chair to hold to. She closed her eyes and breathed deeply.

"Just a minute," she said in her normal voice. "I'll be with you in just a minute. The only time I can get a jolt of this is when one of you visitors gets a dose to get over the skin trouble."

She turned to the room mirror to adjust her hair. Speaking with her back to him, she said, "I hope I didn't say anything about downstairs."

Mercer still had the cap on. He loved this beautiful girl who had put it on him. He was ready to weep at the thought that she had had the same kind of pleasure which he still enjoyed. Not for the world would he say anything which could hurt her feelings. He was sure she wanted to be told that she had not said anything about "downstairs" — probably shop talk for the surface of Shayol — so he assured her warmly, "You said nothing. Nothing at all."

She came over to the bed, leaned, kissed him on the lips. The kiss was as far away as the pain; he felt nothing; the Niagara of throbbing pleasure which poured through his head left no room for more sensation. But he liked the friendliness of it. A grim, sane corner of his mind whispered to him that this was probably the last time he

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would ever kiss a woman, but it did not seem to matter.

With skilled fingers she adjusted the cap on his head. "There, now. You're a sweet guy. I'm going to pretend-forget and leave the cap on you till the doctor comes."

With a bright smile she squeezed his shoulder.

She hastened out of the room.

The white of her skirt flashed prettily as she went out the door. He saw that she had very shapely legs indeed.

She was nice, but the cap . . . ah, it was the cap that mattered! He closed his eyes and let the cap go on stimulating the pleasure centers of his brain. The pain in his skin was still there, but it did not matter any more than did the chair standing in the corner. The pain was just something that happened to be in the room.

A FIRM touch on his arm made him open his eyes.

The older, authoritative-looking man was standing beside the bed, looking down at him with a quizzical smile.

"She did it again," said the old man.

Mercer shook his head, trying to indicate that the young nurse had done nothing wrong.

"I'm Doctor Vomact," said the older man, "and I am going to take this cap off you. You will then experience the pain again, but I think it will not be so bad. You can have the cap several more times before you leave here."

With a swift, firm gesture he snatched the cap off Mercer's head.

Mercer promptly doubled up with the inrush of fire from his skin. He started to scream and then saw that Doctor Vomact was watching him calmly.

Mercer gasped, "It is — easier now."

"I knew it would be," said the doctor. "I had to take the cap off to talk to you. You have a few choices to make."

"Yes, doctor," gasped Mercer.

"You have committed a serious crime and you are going down to the surface of Shayol."

"Yes," said Mercer.

"Do you want to tell me your crime?"

Mercer thought of the white palace walls in perpetual sunlight, and the soft mewing of the little things when he reached them. He tightened his arms, legs, back and jaw. "No," he said, "I don't want to talk about it. It's the crime without a name. Against the Imperial family . . ."

"Fine," said the doctor, "that's a healthy attitude. The crime is past. Your future is ahead. Now, I can destroy your mind before

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you go down — if you want me to."

"That's against the law," said Mercer.

Doctor Vomact smiled warmly and confidently. "Of course it is. A lot of things are against human law. But there are laws of science, too. Your body, down on Shayol, is going to serve science. It doesn't matter to me whether that body has Mercer's mind or the mind of a low-grade shellfish. I have to leave enough mind in you to keep the body going, but I can wipe out the historic you and give your body a better chance of being happy. It's your choice, Mercer. Do you want to be you or not?"

Mercer shook his head back and forth, "I don't know."

"I'm taking a chance," said Doctor Vomact, "in giving you this much leeway. I'd have it done if I were in your position. It's pretty bad down there."

Mercer looked at the full, broad face. He did not trust the comfortable smile. Perhaps this was a trick to increase his punishment. The cruelty of the Emperor was proverbial. Look at what he had done to the widow of his predecessor, the Dowager Lady Da. She was younger than the Emperor himself, and he had sent her to a place worse than death. If he had been sentenced to Shayol, why was this doctor trying to interfere with the rules? Maybe the doctor himself had been conditioned, and did not know what he was offering.

Doctor Vomact read Mercer's face. "All right. You refuse. You want to take your mind down with you. It's all right with me. I don't have you on my conscience. I suppose you'll refuse the next offer too. Do you want me to take your eyes out before you go down? You'll be much more comfortable without vision. I *know* that, from the voices that we record for the warning broadcasts. I can sear the optic nerves so that there will be no chance of your getting vision again."

Mercer rocked back and forth. The fiery pain had become a universal itch, but the soreness of his spirit was greater than the discomfort of his skin.

"You refuse that, too?" said the doctor.

"I suppose so," said Mercer.

"Then all I have to do is to get ready. You can have the cap for a while, if you want."

MERCER said, "Before I put the cap on, can you tell me what happens down there?"

"Some of it," said the doctor. "There is an attendant. He is a man, but not a human being. He is a homunculus fashioned out of cattle material. He is intelli-

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gent and very conscientious. You specimens are turned loose on the surface of Shayol. The dromozoa are a special life-form there. When they settle in your body, B'dikkat — that's the attendant — carves them out with an anesthetic and sends them up here. We freeze the tissue cultures, and they are compatible with almost any kind of oxygen-based life. Half the surgical repair you see in the whole universe comes out of buds that we ship from here. Shayol is a very healthy place, so far as survival is concerned. You won't die."

"You mean," said Mercer, "that I am getting perpetual punishment."

"I didn't say that," said Doctor Vomact. "Or if I did, I was wrong. You won't die soon. I don't know how long you will live down there. Remember, no matter how uncomfortable you get, the samples which B'dikkat sends up will help thousands of people in all the inhabited worlds. Now take the cap."

"I'd rather talk," said Mercer. "It may be my last chance."

The doctor looked at him strangely. "If you can stand that pain, go ahead and talk."

"Can I commit suicide down there?"

"I don't know," said the doctor. "It's never happened. And to judge by the voices, you'd think they wanted to."

"Has anybody ever come back from Shayol?"

"Not since it was put off limits about four hundred years ago."

"Can I talk to other people down there?"

"Yes," said the doctor.

"Who punishes me down there?"

"Nobody does, you fool," cried Doctor Vomact. "It's not punishment. People don't like it down on Shayol, and it's better, I guess, to get convicts instead of volunteers. But there isn't anybody *against* you at all."

"No jailers?" asked Mercer, with a whine in his voice.

"No jailers, no rules, no prohibitions. Just Shayol, and B'dikkat to take care of you. Do you still want your mind and your eyes?"

"I'll keep them," said Mercer. "I've gone this far and I might as well go the rest of the way."

"Then let me put the cap on you for your second dose," said Doctor Vomact.

The doctor adjusted the cap just as lightly and delicately as had the nurse; he was quicker about it. There was no sign of his picking out another cap for himself.

The inrush of pleasure was like a wild intoxication. His

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burning skin receded into distance. The doctor was near in space, but even the doctor did not matter. Mercer was not afraid of Shayol. The pulsation of happiness out of his brain was too great to leave room for fear or pain.

Doctor Vomact was holding out his hand..

Mercer wondered why, and then realized that the wonderful, kindly cap-giving man was offering to shake hands. He lifted his own. It was heavy, but his arm was happy, too.

They shook hands. It was curious, thought Mercer, to feel the handshake beyond the double level of cerebral pleasure and dermal pain.

"Good-by, Mr. Mercer," said the doctor. "Goodby and a good good night. . ."

II

THE ferry satellite was a hospitable place. The hundreds of hours that followed were like a long, weird dream.

Twice again the young nurse sneaked into his bedroom with him when he was being given the cap and had a cap with him. There were baths which calloused his whole body. Under strong local anesthetics, his teeth were taken out and stainless steel took their place. There were irradiations under blazing lights which took away the pain of his skin. There were special treatments for his fingernails and toenails. Gradually they changed into formidable claws; he found himself stropping them on the aluminum bed one night and saw that they left deep marks.

His mind never became completely clear.

Sometimes he thought that he was home with his mother, that he was little again, and in pain. Other times, under the cap, he laughed in his bed to think that people were sent to this place for punishment when it was all so terribly much fun. There were no trials, no questions, no judges. Food was good, but he did not think about it much; the cap was better. Even when he was awake, he was drowsy.

At last, with the cap on him, they put him into a adiabatic pod — a one-body missile which could be dropped from the ferry to the planet below. He was all closed in, except for his face.

Doctor Vomact seemed to swim into the room. "You are strong, Mercer," the doctor shouted, "you are very strong! Can you hear me?"

Mercer nodded.

"We wish you well, Mercer. No matter what happens, remember you are helping other people up here."

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"Can I take the cap with me?" said Mercer.

For an answer, Doctor Vomact removed the cap himself. Two men closed the lid of the pod, leaving Mercer in total darkness. His mind started to clear, and he panicked against his wrappings.

There was the roar of thunder and the taste of blood.

THE next thing that Mercer knew, he was in a cool, cool room, much chillier than the bedrooms and operating rooms of the satellite. Someone was lifting him gently onto a table.

He opened his eyes.

An enormous face, four times the size of any human face Mercer had ever seen, was looking down at him. Huge brown eyes, cowlike in their gentle inoffensiveness, moved back and forth as the big face examined Mercer's wrappings. The face was that of a handsome man of middle years, clean-shaven, hair chestnut-brown, with sensual full lips and gigantic but healthy yellow teeth exposed in a half smile. The face saw Mercer's eyes open, and spoke with a deep friendly roar.

"I'm your best friend. My name is B'dikkat, but you don't have to use that here. Just call me Friend, and I will always help you."

"I hurt," said Mercer.

"Of course you do. You hurt all over. That's a big drop," said B'dikkat.

"Can I have a cap, please," begged Mercer. It was not a question; it was a demand; Mercer felt that his private inward eternity depended on it.

B'dikkat laughed. "I haven't any caps down here. I might use them myself. Or so they think. I have other things, much better. No fear, fellow, I'll fix you up."

Mercer looked doubtful. If the cap had brought him happiness on the ferry, it would take at least electrical stimulation of the brain to undo whatever torments the surface of Shayol had to offer.

B'dikkat's laughter filled the room like a bursting pillow.

"Have you ever heard of condamine?"

"No," said Mercer.

"It's a narcotic so powerful that the pharmacopeias are not allowed to mention it."

"You have that?" said Mercer hopefully.

"Something better. I have super-condamine. It's named after the New French town where they developed it. The chemists hooked in one more hydrogen molecule. That gave it a real jolt. If you took it in your present shape, you'd be dead in three minutes, but those three

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minutes would seem like ten thousand years of happiness to the inside of your mind." B'dikkat rolled his brown cow eyes expressively and smacked his rich red lips with a tongue of enormous extent.

"What's the use of it, then?"

"*You* can take it," said B'dikkat. "You can take it after you have been exposed to the dromozoa outside this cabin. You get all the good effects and none of the bad. You want to see something?"

What answer is there except *yes,* thought Mercer grimly; does he think I have an urgent invitation to a tea party?

"Look out the window," said B'dikkat, "and tell me what you see."

The atmosphere was clear. The surface was like a desert, ginger-yellow with streaks of green where lichen and low shrubs grew, obviously stunted and tormented by high, dry winds. The landscape was monotonous. Two or three hundred yards away there was a herd of bright pink objects which seemed alive, but Mercer could not see them well enough to describe them clearly. Further away, on the extreme right of his frame of vision, there was the statue of an enormous human foot, the height of a six-story building. Mercer could not see what the foot was connected to. "I see a big foot," said he, "but — "

"But what?" said B'dikkat, like an enormous child hiding the denouement of a hugely private joke. Large as he was, he would have been dwarfed by any one of the toes on that tremendous foot.

"But it can't be a real foot," said Mercer.

"It is," said B'dikkat. "That's Go-Captain Alvarez, the man who found this planet. After six hundred years he's still in fine shape. Of course, he's mostly dromozootic by now, but I think there is some human consciousness inside him. You know what I do?"

"What?" said Mercer.

"I give him six cubic centimeters of super-condamine and he snorts for me. Real happy little snorts. A stranger might think it was a volcano. That's what super-condamine can do. And you're going to get plenty of it. You're a lucky, lucky man, Mercer. You have me for a friend, and you have my needle for a treat. I do all the work and you get all the fun. Isn't that a nice surprise?"

Mercer thought, You're lying! Lying! Where do the screams come from that we have all heard broadcast as a warning on Punishment Day? Why did the

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doctor offer to cancel my brain or to take out my eyes?

The cow-man watched him sadly, a hurt expression on his face. "You don't believe me," he said, very sadly.

"It's not quite that," said Mercer, with an attempt at heartiness, "but I think you're leaving something out."

"Nothing much," said B'dikkat. "You jump when the dromozoa hit you. You'll be upset when you start growing new parts — heads, kidneys, hands. I had one fellow in here who grew thirty-eight hands in a single session outside. I took them all off, froze them and sent them upstairs. I take good care of everybody. You'll probably yell for a while. But remember, just call me Friend, and I have the nicest treat in the universe waiting for you. Now, would you like some fried eggs? I don't eat eggs myself, but most true men like them."

"Eggs?" said Mercer. "What have eggs got to do with it?"

"Nothing much. It's just a treat for you people. Get something in your stomach before you go outside. You'll get through the first day better."

Mercer, unbelieving, watched as the big man took two precious eggs from a cold chest, expertly broke them into a little pan and put the pan in the heat-field at the center of the table Mercer had awakened on.

"Friend, eh?" B'dikkat grinned. "You'll see I'm a good friend. When you go outside, remember that."

AN hour later, Mercer did go outside.

Strangely at peace with himself, he stood at the door. B'dikkat pushed him in a brotherly way, giving him a shove which was gentle enough to be an encouragement.

"Don't make me put on my lead suit, fellow." Mercer had seen a suit, fully the size of an ordinary space-ship cabin, hanging on the wall of an adjacent room. "When I close this door, the outer one will open. Just walk on out."

"But what will happen?" said Mercer, the fear turning around in his stomach and making little grabs at his throat from the inside.

"Don't start that again," said B'dikkat. For an hour he had fended off Mercer's questions about the outside. A map? B'dikkat had laughed at the thought. Food? He said not to worry. Other people? They'd be there. Weapons? What for, B'dikkat had replied. Over and over again, B'dikkat had insisted that he was Mercer's friend. What would happen to Mercer? The

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same that happened to every body else.

Mercer stepped out.

Nothing happened. The day was cool. The wind moved gently against his toughened skin.

Mercer looked around apprehensively.

The mountainous body of Captain Alvarez occupied a good part of the landscape to the right. Mercer had no wish to get mixed up with that. He glanced back at the cabin. B'dikkat was not looking out the window.

Mercer walked slowly, straight ahead.

There was a flash on the ground, no brighter than the glitter of sunlight on a fragment of glass. Mercer felt a sting in the thigh, as though a sharp instrument had touched him lightly. He brushed the place with his hand.

It was as though the sky fell in.

A pain — it was more than a pain: it was a living throb — ran from his hip to his foot on the right side. The throb reached up to his chest, robbing him of breath. He fell, and the ground hurt him. Nothing in the hospital-satellite had been like this. He lay in the open air, trying not to breathe, but he did breathe anyhow. Each time he breathed, the throb moved with his thorax. He lay on his back, looking at the sun. At last he noticed that the sun was violet-white.

It was no use even thinking of calling. He had no voice. Tendrils of discomfort twisted within him. Since he could not stop breathing, he concentrated on taking air in the way that hurt him least. Gasps were too much work. Little tiny sips of air hurt him least.

The desert around him was empty. He could not turn his head to look at the cabin. Is this it? he thought. Is an eternity of this the punishment of Shayol?

There were voices near him.

Two faces, grotesquely pink, looked down at him. They might have been human. The man looked normal enough, except for having two noses side by side. The woman was a caricature beyond belief. She had grown a breast on each cheek and a cluster of naked baby-like fingers hung limp from her forehead.

"It's a beauty," said the woman, "a new one."

"Come along," said the man.

They lifted him to his feet. He did not have strength enough to resist. When he tried to speak to them a harsh cawing sound, like the cry of an ugly bird, came from his mouth.

They moved with him effi-

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ciently. He saw that he was being dragged to the herd of pink things.

As they approached, he saw that they were people. Better, he saw that they had once been people. A man with the beak of a flamingo was picking at his own body. A woman lay on the ground; she had a single head, but beside what seemed to be her original body, she had a boy's naked body growing sidewise from her neck. The boy-body, clean, new, paralytically helpless, made no movement other than shallow breathing. Mercer looked around. The only one of the group who was wearing clothing was a man with his overcoat on sidewise. Mercer stared at him, finally realizing that the man had two — or was it three? — stomachs growing on the outside of his abdomen. The coat held them in place. The transparent peritoneal wall looked fragile.

"New one," said his female captor. She and the two-nosed man put him down.

THE group lay scattered on the ground.

Mercer lay in a state of stupor among them.

An old man's voice said, "I'm afraid they're going to feed us pretty soon."

"Oh, no!" "It's too early!" "Not again!" Protests echoed from the group.

The old man's voice went on, "Look, near the big toe of the mountain!"

The desolate murmur in the group attested their confirmation of what he had seen.

Mercer tried to ask what it was all about, but produced only a caw.

A woman — was it a woman? — crawled over to him on her hands and knees. Beside her ordinary hands, she was covered with hands all over her trunk and halfway down her thighs. Some of the hands looked old and withered. Others were as fresh and pink as the baby-fingers on his captress' face. The woman shouted at him, though it was not necessary to shout.

"The dromozoa are coming. This time it hurts. When you get used to the place, you can dig in — "

She waved at a group of mounds which surrounded the herd of people.

"They're dug in," she said.

Mercer cawed again.

"Don't you worry," said the hand-covered woman, and gasped as a flash of light touched her.

The lights reached Mercer too. The pain was like the first contact but more probing. Mercer felt his eyes widen as odd sensations within his body led to

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an inescapable conclusion: these lights, these things, these whatever-they-were, were feeding him and building him up.

Their intelligence, if they had it, was not human, but their motives were clear. In between the stabs of pain he felt them fill his stomach, put water in his blood, draw water from his kidneys and bladder, massage his heart, move his lungs for him.

Every single thing they did was well meant and beneficent in intent.

And every single action hurt.

Abruptly, like the lifting of a cloud of insects, they were gone. Mercer was aware of a noise somewhere outside — a brainless, bawling cascade of ugly noise. He started to look around. And the noise stopped.

It had been himself, screaming. Screaming the ugly screams of a psychotic, a terrified drunk, an animal driven out of understanding or reason.

When he stopped, he found he had his speaking voice again.

A man came to him, naked like the others. There was a spike sticking through his head. The skin had healed around it on both sides. "Hello, fellow," said the man with the spike.

"Hello," said Mercer. It was a foolishly commonplace thing to say in a place like this.

"You can't kill yourself," said the man with the spike through his head.

"Yes, you can," said the woman, covered with hands.

Mercer found that his first pain had disappeared. "What's happening to me?"

"You got a part," said the man with the spike. "They're always putting parts on us. After a while B'dikkat comes and cuts most of them off, except for the ones that ought to grow a little more. Like her," he added, nodding at the woman who lay with the boy-body growing from her neck.

"And that's all?" said Mercer. "The stabs for the new parts and the stinging for the feeding."

"No," said the man. "Sometimes they think we're too cold and they fill our insides with fire. Or they think we're too hot and they freeze us, nerve by nerve."

The woman with the boy-body called over, "And sometimes they think we're unhappy, so they try to force us to be happy. *I* think that's the worst of all."

Mercer stammered, "Are you people — I mean — are you the only herd?"

The man with the spike coughed instead of laughing. "Herd! That's funny. The land is full of people. Most of them dig in. We're the ones who can

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still talk; we stay together for company. We get more turns with B'dikkat that way."

Mercer started to ask another question, but he felt the strength run out of him. The day had been too much.

The ground rocked like a ship on water. The sky turned black. He felt someone catch him as he fell. He felt himself being stretched out on the ground. And then, mercifully and magically, he slept.

III

WITHIN a week, he came to know the group well. They were an absent-minded bunch of people. Not one of them ever knew when a dromozoon might flash by and add another part. Mercer was not stung again, but the incision he had obtained just outside the cabin was hardening. Spike-head looked at it when Mercer modestly undid his belt and lowered the edge of his trouser-top so they could see the wound.

"You've got a head," he said. "A whole baby head. They'll be glad to get that one upstairs when B'dikkat cuts it off you."

The group even tried to arrange his social life. They introduced him to the girl of the herd. She had grown one body after another, pelvis turning into shoulders and the pelvis below that turning into shoulders again until she was five people long. Her face was unmarred. She tried to be friendly to Mercer.

He was so shocked by her that he dug himself into the soft dry crumbly earth and stayed there for what seemed like a hundred years. He found later that it was less than a full day. When he came out, the long many-bodied girl was waiting for him.

"You didn't have to come out just for me," said she.

Mercer shook the dirt off himself.

He looked around. The violet sun was going down, and the sky was streaked with blues, deeper blues and trails of orange sunset.

He looked back at her. "I didn't get up for you. It's no use lying there, waiting for the next time."

"I want to show you something," she said. She pointed to a low hummock. "Dig that up."

Mercer looked at her. She seemed friendly. He shrugged and attacked the soil with his powerful claws. With tough skin and heavy digging-nails on the ends of his fingers, he found it was easy to dig like a dog. The earth cascaded beneath his busy hands. Something pink appeared down in the hole he had dug. He proceeded more carefully.

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He knew what it would be.

It was. It was a man, sleeping. Extra arms grew down one side of his body in an orderly series. The other side looked normal.

Mercer turned back to the many-bodied girl, who had writhed closer.

"That's what I think it is, isn't it?"

"Yes," she said. "Doctor Vomact burned his brain out for him. And took his eyes out, too."

Mercer sat back on the ground and looked at the girl. "You told me to do it. Now tell me what for."

"To let you see. To let you know. To let you think."

"That's all?" said Mercer.

The girl twisted with startling suddenness. All the way down her series of bodies, her chests heaved. Mercer wondered how the air got into all of them. He did not feel sorry for her; he did not feel sorry for anyone except himself. When the spasm passed the girl smiled at him apologetically.

"They just gave me a new plant."

Mercer nodded grimly.

"What now, a hand? It seems you have enough."

"Oh, those," she said, looking back at her many torsos. "I promised B'dikkat that I'd let them grow. He's *good*. But that man, stranger. Look at that man you dug up. Who's better off, he or we?"

Mercer stared at her. "Is that what you had me dig him up for?"

"Yes," said the girl.

"Do you expect me to answer?"

"No," said the girl, "not now."

"Who are you?" said Mercer.

"We never ask that here. It doesn't matter. But since you're new, I'll tell you. I used to be the Lady Da — the Emperor's stepmother."

"You!" he exclaimed.

She smiled, ruefully. "You're still so fresh you think it matters! But I have something more important to tell you." She stopped and bit her lip.

"What?" he urged. "Better tell me before I get another bite. I won't be able to think or talk then, not for a long time. Tell me now."

She brought her face close to his. It was still a lovely face, even in the dying orange of this violet-sunned sunset. "People never live forever."

"Yes," said Mercer. "I knew that."

"*Believe* it," ordered the Lady Da.

Lights flashed across the dark plain, still in the distance. Said she, "Dig in, dig in for the night. They may miss you."

Mercer started digging. He

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glanced over at the man he had dug up. The brainless body, with motions as soft as those of a starfish under water, was pushing its way back into the earth.

FIVE or seven days later, there was a shouting through the herd.

Mercer had come to know a half-man, the lower part of whose body was gone and whose viscera were kept in place with what resembled a translucent plastic bandage. The half-man had shown him how to lie still when the dromozoa came with their inescapable errands of doing good.

Said the half-man, "You can't fight them. They made Alvarez as big as a mountain, so that he never stirs. Now they're trying to make us happy. They feed us and clean us and sweeten us up. Lie still. Don't worry about screaming. We all do."

"When do we get the drug?" said Mercer.

"When B'dikkat comes."

B'dikkat came that day, pushing a sort of wheeled sled ahead of him. The runners carried it over the hillocks; the wheels worked on the surface.

Even before he arrived, the herd sprang into furious action. Everywhere, people were digging up the sleepers. By the time B'dikkat reached their waiting place, the herd must have uncovered twice their own number of sleeping pink bodies — men and woman, young and old. The sleepers looked no better and no worse than the waking ones.

"Hurry!" said the Lady Da. "He never gives any of us a shot until we're all ready."

B'dikkat wore his heavy lead suit.

He lifted an arm in friendly greeting, like a father returning home with treats for his children. The herd clustered around him but did not crowd him.

He reached into the sled. There was a harnessed bottle which he threw over his shoulders. He snapped the locks on the straps. From the bottle there hung a tube. Midway down the tube there was a small pressure-pump. At the end of the tube there was a glistening hypodermic needle.

When ready, B'dikkat gestured for them to come closer. They approached him with radiant happiness. He stepped through their ranks and past them, to the girl who had the boy growing from her neck. His mechanical voice boomed through the loudspeaker set in the top of his suit.

"Good girl. Good, good girl. You get a big, big present." He thrust the hypodermic into her so long that Mercer could see

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an air bubble travel from the pump up to the bottle.

Then he moved back to the others, booming a word now and then, moving with improbable grace and speed amid the people. His needle flashed as he gave them hypodermics under pressure. The people dropped to sitting position or lay down on the ground as though half-asleep.

HE knew Mercer. "Hello, fellow. Now you can have the fun. It would have killed you in the cabin. Do you have anything for me?"

Mercer stammered, not knowing what B'dikkat meant, and the two-nosed man answered for him, "I think he has a nice baby head, but it isn't big enough for you to take yet."

Mercer never noticed the needle touch his arm.

B'dikkat had turned to the next knot of people when the super-condamine hit Mercer.

He tried to run after B'dikkat, to hug the lead space suit, to tell B'dikkat that he loved him. He stumbled and fell, but it did not hurt.

The many-bodied girl lay near him. Mercer spoke to her.

"Isn't it wonderful? You're beautiful, beautiful, beautiful. I'm so happy to be here."

The woman covered with growing hands came and sat beside them. She radiated warmth and good fellowship. Mercer thought that she looked very distinguished and charming. He struggled out of his clothes. It was foolish and snobbish to wear clothing when none of these nice people did.

The two women babbled and crooned at him.

With one corner of his mind he knew that they were saying nothing, just expressing the euphoria of a drug so powerful that the known universe had forbidden it. With most of his mind he was happy. He wondered how anyone could have the good luck to visit a planet as nice as this. He tried to tell the Lady Da, but the words weren't quite straight.

A painful stab hit him in the abdomen. The drug went after the pain and swallowed it. It was like the cap in the hospital, only a thousand times better. The pain was gone, though it had been crippling the first time.

He forced himself to be deliberate. He rammed his mind into focus and said to the two ladies who lay pinkly nude beside him in the desert, "That was a good bite. Maybe I will grow another head. That would make B'dikkat happy!"

The Lady Da forced the foremost of her bodies in an upright position. Said she, "I'm strong,

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too. I can talk. Remember, man, remember. People never live forever. We can die, too, we can die like real people. I do so believe in death!"

Mercer smiled at her through his happiness.

"Of course you can. But isn't this nice . . ."

With this he felt his lips thicken and his mind go slack. He was wide awake, but he did not feel like doing anything. In that beautiful place, among all those companionable and attractive people, he sat and smiled.

B'dikkat was sterilizing his knives.

MERCER wondered how long the super-condamine had lasted him. He endured the ministrations of the dromozoa without screams or movement. The agonies of nerves and itching of skin were phenomena which happened somewhere near him, but meant nothing. He watched his own body with remote, casual interest. The Lady Da and the hand-covered woman stayed near him. After a long time the half-man dragged himself over to the group with his powerful arms. Having arrived he blinked sleepily and friendlily at them, and lapsed back into the restful stupor from which he had emerged. Mercer saw the sun rise on occasion, closed his eyes briefly, and opened them to see stars shining. Time had no meaning. The dromozoa fed him in their mysterious way; the drug canceled out his needs for cycles of the body.

At last he noticed a return of the inwardness of pain.

The pains themselves had not changed; he had.

He knew all the events which could take place on Shayol. He remembered them well from his happy period. Formerly he had noticed them — now he felt them.

He tried to ask the Lady Da how long they had had the drug, and how much longer they would have to wait before they had it again. She smiled at him with benign, remote happiness; apparently her many torsos, stretched out along the ground, had a greater capacity for retaining the drug than did his body. She meant him well, but was in no condition for articulate speech.

The half-man lay on the ground, arteries pulsating prettily behind the half-transparent film which protected his abdominal cavity.

Mercer squeezed the man's shoulder.

The half-man woke, recognized Mercer and gave him a healthily sleepy grin.

"'A good morrow to you, my

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boy.' That's out of a play. Did you ever see a play?"

"You mean a game with cards?"

"No," said the half-man, "a sort of eye-machine with real people doing the figures."

"I never saw that," said Mercer, "but I —"

"But you want to ask me when B'dikkat is going to come back with the needle."

"Yes," said Mercer, a little ashamed of his obviousness.

"Soon," said the half-man. "That's why I think of plays. We all know what is going to happen. We all know when it is going to happen. We all know what the dummies will do — " he gestured at the hummocks in which the decorticated men were cradled — "and we all know what the new people will ask. But we never know how long a scene is going to take."

"What's a 'scene'?" asked Mercer. "Is that the name for the needle?"

The half-man laughed with something close to real humor. "No, no, no. You've got the lovelies on the brain. A scene is just a part of a play. I mean we know the order in which things happen, but we have no clocks and nobody cares enough to count days or to make calendars and there's not much climate here, so none of us know how long anything takes. The pain seems short and the pleasure seems long. I'm inclined to think that they are about two Earth-weeks each."

Mercer did not know what an "Earth-week" was, since he had not been a well-read man before his conviction, but he got nothing more from the half-man at that time. The half-man received a dromozootic implant, turned red in the face, shouted senselessly at Mercer, "Take it out, you fool! Take it out of me!"

When Mercer looked on helplessly, the half-man twisted over on his side, his pink dusty back turned to Mercer, and wept hoarsely and quietly to himself.

MERCER himself could not tell how long it was before B'dikkat came back. It might have been several days. It might have been several months.

Once again B'dikkat moved among them like a father; once again they clustered like children. This time B'dikkat smiled pleasantly at the little head which had grown out of Mercer's thigh — a sleeping child's head, covered with light hair on top and with dainty eyebrows over the resting eyes. Mercer got the blissful needle.

When B'dikkat cut the head from Mercer's thigh, he felt the knife grinding against the carti-

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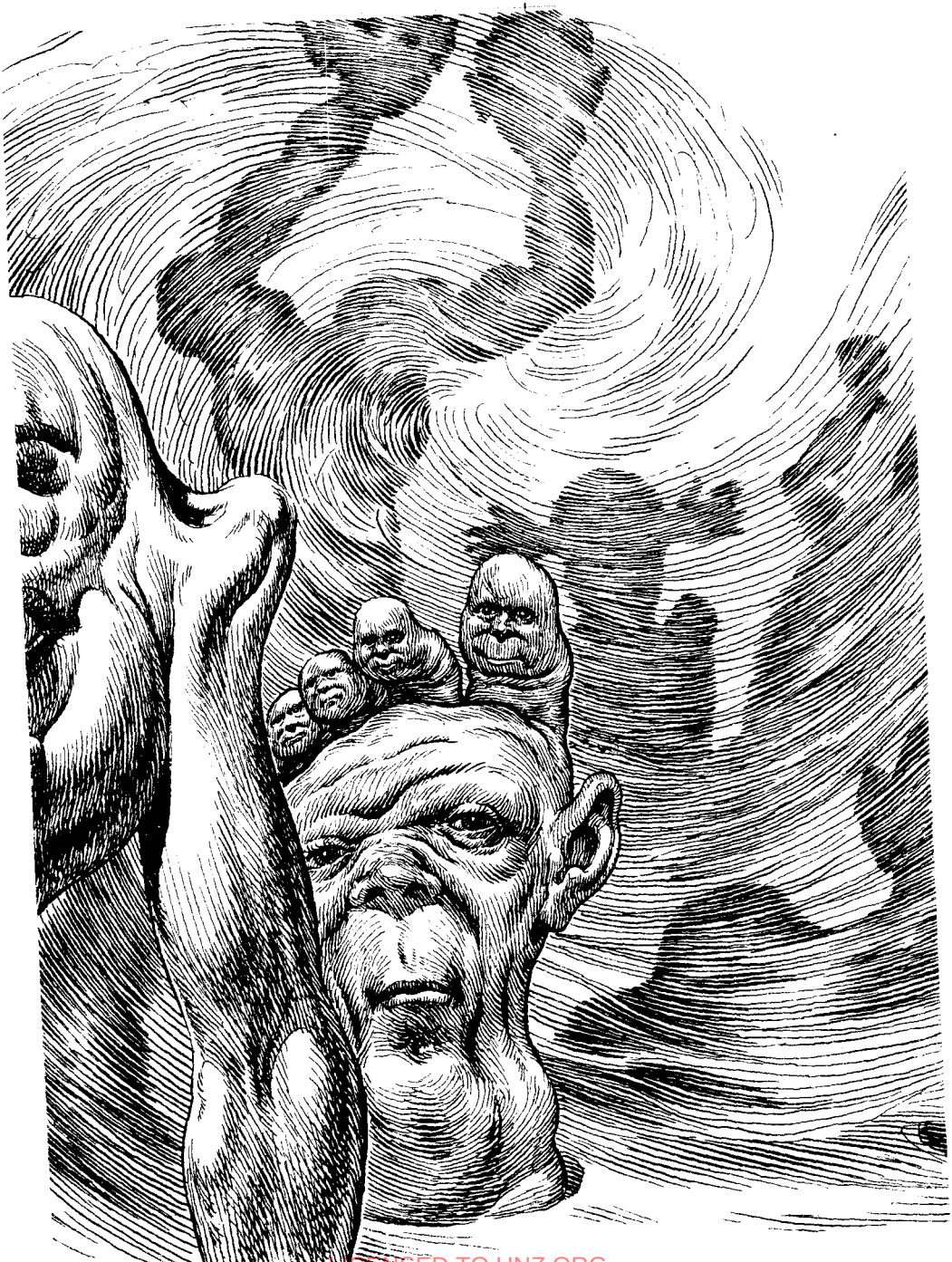

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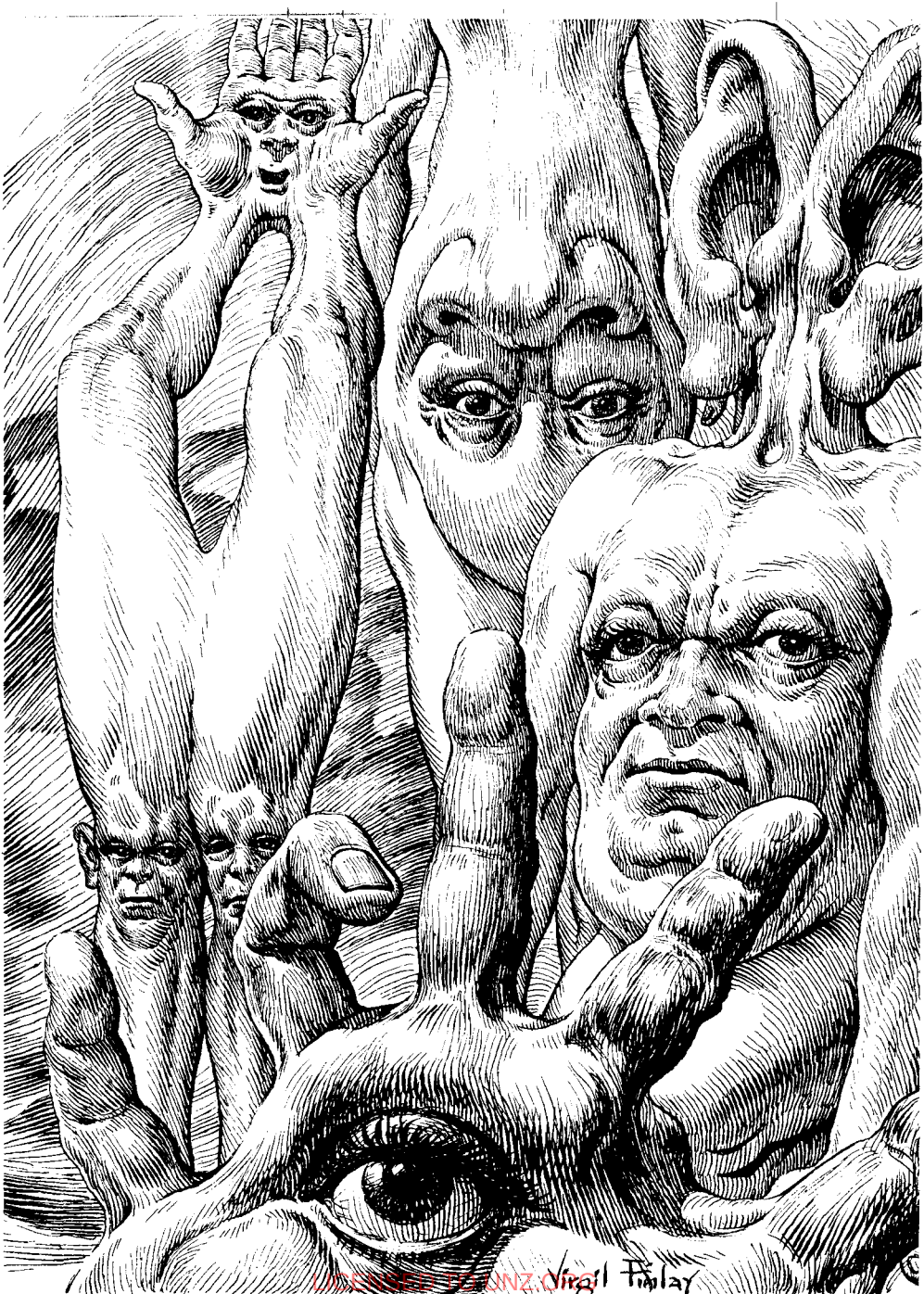

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lage which held the head to his own body. He saw the child-face grimace as the head was cut; he felt the far, cool flash of unimportant pain, as B'dikkat dabbed the wound with a corrosive antiseptic which stopped all bleeding immediately.

The next time it was two legs growing from his chest.

Then there had been another head beside his own.

Or was that after the torso and legs, waist to toe-tips, of the little girl which had grown from his side?

He forgot the order.

He did not count time.

Lady Da smiled at him often, but there was no love in this place. She had lost the extra torsos. In between teratologies, she was a pretty and shapely woman; but the nicest thing about their relationship was her whisper to him, repeated some thousands of time, repeated with smiles and hope, "People never live forever."

She found this immensely comforting, even though Mercer did not make much sense out of it.

Thus events occurred, and victims changed in appearance, and new ones arrived. Sometimes B'dikkat took the new ones, resting in the everlasting sleep of their burned-out brains, in a ground-truck to be added to other herds. The bodies in the truck threshed and bawled without human speech when the dromozoa struck them.

Finally, Mercer did manage to follow B'dikkat to the door of the cabin. He had to fight the bliss of super-condamine to do it. Only the memory of previous hurt, bewilderment and perplexity made him sure that if he did not ask B'dikkat when he, Mercer, was happy, the answer would no longer be available when he needed it. Fighting pleasure itself, he begged B'dikkat to check the records and to tell him how long he had been there.

B'dikkat grudgingly agreed, but he did not come out of the doorway. He spoke through the public address box built into the cabin, and his gigantic voice roared out over the empty plain, so that the pink herd of talking people stirred gently in their happiness and wondered what their friend B'dikkat might be wanting to tell them. When he said it, they thought it exceedingly profound, though none of them understood it, since it was simply the amount of time that Mercer had been on Shayol:

"Standard years — eighty-four years, seven months, three days, two hours, eleven and one half minutes. Good luck, fellow."

Mercer turned away.

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The secret little corner of his mind, which stayed sane through happiness and pain, made him wonder about B'dikkat. What persuaded the cow-man to remain on Shayol? What kept him happy without super-condamine? Was B'dikkat a crazy slave to his own duty or was he a man who had hopes of going back to his own planet some day, surrounded by a family of little cow-people resembling himself? Mercer, despite his happiness, wept a little at the strange fate of B'dikkat. His own fate he accepted.

He remembered the last time he had eaten — actual eggs from an actual pan. The dromozoa kept him alive, but he did not know how they did it.

He staggered back to the group. The Lady Da, naked in the dusty plain, waved a hospitable hand and showed that there was a place for him to sit beside her. There were unclaimed square miles of seating space around them, but he appreciated the kindliness of her gesture none the less.

IV

THE years, if they were years, went by. The land of Shayol did not change.

Sometimes the bubbling sound of geysers came faintly across the plain to the herd of men; those who could talk declared it to be the breathing of Captain Alvarez. There was night and day, but no setting of crops, no change of season, no generations of men. Time stood still for these people, and their load of pleasure was so commingled with the shocks and pains of the dromozoa that the words of the Lady Da took on very remote meaning.

"People never live forever."

Her statement was a hope, not a truth in which they could believe. They did not have the wit to follow the stars in their courses, to exchange names with each other, to harvest the experience of each for the wisdom of all. There was no dream of escape for these people. Though they saw the old-style chemical rockets lift up from the field beyond B'dikkat's cabin, they did not make plans to hide among the frozen crop of transmuted flesh.

Far long ago, some other prisoner than one of these had tried to write a letter. His handwriting was on a rock. Mercer read it, and so had a few of the others, but they could not tell which man had done it. Nor did they care.

The letter, scraped on stone, had been a message home. They could still read the opening: "Once, I was like you, stepping out of my window at the end of

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day, and letting the winds blow me gently toward the place I lived in. Once, like you, I had one head, two hands, ten fingers on my hands. The front part of my head was called a face, and I could talk with it. Now I can only write, and that only when I get out of pain. Once, like you, I ate foods, drank liquid, had a name. I cannot remember the name I had. You can stand up, you who get this letter. I cannot even stand up. I just wait for the lights to put my food in me molecule by molecule, and to take it out again. Don't think that I am punished any more. This place is not a punishment. It is something else."

Among the pink herd, none of them ever decided what was "something else."

Curiosity had died among them long ago.

THEN came the day of the little people.

It was a time — not an hour, not a year: a duration somewhere between them — when the Lady Da and Mercer sat wordless with happiness and filled with the joy of super-condamine. They had nothing to say to one another; the drug said all things for them.

A disagreeable roar from B'dikkat's cabin made them stir mildly.

Those two, and one or two others, looked toward the speaker of the public address system.

The Lady Da brought herself to speak, though the matter was unimportant beyond words. "I do believe," said she, "that we used that call that the War Alarm."

They drowsed back into their happiness.

A man with two rudimentary heads growing beside his own crawled over to them. All three heads looked very happy, and Mercer thought it delightful of him to appear in such a whimsical shape. Under the pulsing glow of super-condamine, Mercer regretted that he had not used times when his mind was clear to ask him who he had once been. He answered it for them. Forcing his eyelids open by sheer will power, he gave the Lady Da and Mercer the lazy ghost of a military salute and said, "Suzdal, ma'am and sir, former cruiser commander. They are sounding the alert. Wish to report that I am . . . I am . . . I am not quite ready for battle."

He dropped off to sleep.

The gentle peremptories of the Lady Da brought his eyes open again.

"Commander, why are they sounding it here? Why did you come to us?"

"You, ma'am, and the gentleman with the ears seem to think best of our group. I thought you might have orders."

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Mercer looked around for the gentleman with the ears. It was himself. In that time his face was almost wholly obscured with a crop of fresh little ears, but he paid no attention to them, other than expecting that B'dikkat would cut them all off in due course and that the dromozoa would give him something else.

The noise from the cabin rose to a higher, ear-splitting intensity.

Among the herd, many people stirred.

Some opened their eyes, looked around, murmured, "It's a noise," and went back to the happy drowsing with super-condamine.

The cabin door opened.

B'dikkat rushed out, *without his suit*. They had never seen him on the outside without his protective metal suit.

He rushed up to them, looked wildly around, recognized the Lady Da and Mercer, picked them up, one under each arm, and raced with them back to the cabin. He flung them into the double door. They landed with bone-splitting crashes, and found it amusing to hit the ground so hard. The floor tilted them into the room. Moments later, B'dikkat followed.

He roared at them, "You're people, or you were. You understand people; I only obey them. But this I will not obey. Look at that!"

Four beautiful human children lay on the floor. The two smallest seemed to be twins, about two years of age. There was a girl of five and a boy of seven or so. All of them had slack eyelids. All of them had thin red lines around their temples and their hair, shaved away, showed how their brains had been removed.

B'dikkat, heedless of danger from dromozoa, stood beside the Lady Da and Mercer, shouting.

"You're real people. I'm just a cow. I do my duty. My duty does not include this. These are *children*."

THE wise, surviving recess of Mercer's mind registered shock and disbelief. It was hard to sustain the emotion, because the super-condamine washed at his consciousness like a great tide, making everything seem lovely. The forefront of his mind, rich with the drug, told him, "Won't it be nice to have some children with us!" But the undestroyed interior of his mind, keeping the honor he knew before he came to Shayol, whispered, "This is a crime worse than any crime we have committed! *And the Empire has done it.*"

"What have you done?" said the Lady Da. "What can we do?"

"I tried to call the satellite. When they knew what I was

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talking about, they cut me off. After all, I'm not people. The head doctor told me to do my work."

"Was it Doctor Vomact?" Mercer asked.

"Vomact?" said B'dikkat. "He died a hundred years ago, of old age. No, a new doctor cut me off. I don't have people-feeling, but I am Earth-born, of Earth blood. I have emotions myself. Pure cattle emotions! *This* I cannot permit."

"What have you done?"

B'dikkat lifted his eyes to the window. His face was illuminated by a determination which, even beyond the edges of the drug which made them love him, made him seem like the father of this world — responsible, honorable, unselfish.

He smiled. "They will kill me for it, I think. But I have put in the Galactic Alert — *all ships here.*"

The Lady Da, sitting back on the floor, declared, "But that's only for new invaders! It is a false alarm." She pulled herself together and rose to her feet. "Can you cut these things off me, right now, in case people come? And get me a dress. And do you have anything which will counteract the effects of the super-condamine?"

"That's what I wanted!" cried B'dikkat. "I will not take these children. You give me leadership."

There and then, on the floor of the cabin, he trimmed her down to the normal proportions of mankind.

The corrosive antiseptic rose like smoke in the air of the cabin. Mercer thought it all very dramatic and pleasant, and dropped off in catnaps part of the time. Then he felt B'dikkat trimming him too. B'dikkat opened a long, long drawer and put the specimens in; from the cold in the room it must have been a refrigerated locker.

He sat them both up against the wall.

"I've been thinking," he said. "There is no antidote for super-condamine. Who would want one? But I can give you the hypos from my rescue boat. They are supposed to bring a person back, no matter what has happened to that person out in space."

There was a whining over the cabin roof. B'dikkat knocked a window out with his fist, stuck his head out of the window and looked up.

"Come on in," he shouted.

THERE was the thud of a landing craft touching ground quickly. Doors whirred. Mercer wondered, mildly, why people dared to land on Shayol. When

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they came in he saw that they were not people; they were Customs Robots, who could travel at velocities which people could never match. One wore the insigne of an inspector.

"Where are the invaders?"

"There are no — " began B'dikkat.

The Lady Da, imperial in her posture though she was completely nude, said in a voice of complete clarity, "I am a former Empress, the Lady Da. Do you know me?"

"No, ma'am," said the robot inspector. He looked as uncomfortable as a robot could look. The drug made Mercer think that it would be nice to have robots for company, out on the surface of Shayol.

"I declare this Top Emergency, in the ancient words. Do you understand? Connect me with the Instrumentality."

"We can't — " said the inspector.

"You can ask," said the Lady Da.

The inspector complied.

The Lady Da turned to B'dikkat. "Give Mercer and me those shots now. Then put us outside the door so the dromozoa can repair these scars. Bring us in as soon as a connection is made. Wrap us in cloth if you do not have clothes for us. Mercer can stand the pain."

"Yes," said B'dikkat, keeping his eyes away from the four soft children and their collapsed eyes.

The injection burned like no fire ever had. It must have been capable of fighting the super-condamine, because B'dikkat put them through the open window, so as to save time going through the door. The dromozoa, sensing that they needed repair, flashed upon them. This time the super-condamine had something else fighting it.

Mercer did not scream but he lay against the wall and wept for ten thousand years; in objective time, it must have been several hours.

The Customs robots were taking pictures. The dromozoa were flashing against them too, sometimes in whole swarms, but nothing happened.

Mercer heard the voice of the communicator inside the cabin calling loudly for B'dikkat. "Surgery Satellite calling Shayol. B'dikkat, get on the line!"

He obviously was not replying.

There were soft cries coming from the other communicator, the one which the customs officials had brought into the room. Mercer was sure that the eye-machine was on and that people in other worlds were looking at Shayol for the first time.

B'dikkat came through the door. He had torn navigation

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charts out of his lifeboat. With these he cloaked them.

Mercer noted that the Lady Da changed the arrangement of the cloak in a few minor ways and suddenly looked like a person of great importance.

They re-entered the cabin door.

B'dikkat whispered, as if filled with awe, "The Instrumentality has been reached, and a Lord of the Instrumentality is about to talk to you."

There was nothing for Mercer to do, so he sat back in a corner of the room and watched. The Lady Da, her skin healed, stood pale and nervous in the middle of the floor.

The room filled with an odorless intangible smoke. The smoke clouded. The full communicator was on.

A human figure appeared.

A WOMAN, dressed in a uniform of radically conservative cut, faced the Lady Da.

"This is Shayol. You are the Lady Da. You called me."

The Lady Da pointed to the children on the floor. "This must not happen," she said. "This is a place of punishments, agreed upon between the Instrumentality and the Empire. No one said anything about children."

The woman on the screen looked down at the children.

"This is the work of insane people!" she cried.

She looked accusingly at the Lady Da, "Are you imperial?"

"I was an Empress, madam," said the Lady Da.

"And you permit this!"

"Permit it?" cried the Lady Da. "I had nothing to do with it." Her eyes widened. "I am a prisoner here myself. Don't you understand?"

The image-woman snapped, "No, I don't."

"I," said the Lady Da, "am a specimen. Look at the herd out there. I came from them a few hours ago."

"Adjust me," said the image woman to B'dikkat. "Let me see that herd."

Her body, standing upright, soared through the wall in a flashing arc and was placed in the very center of the herd.

The Lady Da and Mercer watched her. They saw even the image lose its stiffness and dignity. The image-woman waved an arm to show that she should be brought back into the cabin. B'dikkat tuned her back into the room.

"I owe you an apology," said the image. "I am the Lady Johanna Gnade, one of the Lords of the Instrumentality."

Mercer bowed, lost his balance and had to scramble up from the floor. The Lady Da acknowl-

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edged the introduction with a royal nod.

The two women looked at each other.

"You will investigate," said the Lady Da, "and when you have investigated, please put us all to death. You know about the drug?"

"Don't mention it," said B'dikkat, "don't even say the name into a communicator. It is a secret of the Instrumentality!"

"I am the Instrumentality," said the Lady Johanna. "Are you in pain? I did not think that any of you were alive. I had heard of the surgery banks on your off-limits planet, but I thought that robots tended parts of people and sent up the new grafts by rocket. Are there any people with you? Who is in charge? Who did this to the children?"

B'dikkat stepped in front of the image. He did not bow. "I'm in charge."

"You're underpeople!" cried the Lady Johanna. "You're a cow!"

"A bull, ma'am. My family is frozen back on earth itself, and with a thousand years' service I am earning their freedom and my own. Your other questions, ma'am. I do all the work. The dromozoa do not affect me much, though I have to cut a part off myself now and then. I throw those away. They don't go into the bank. Do you know the secret rules of this place?"

The Lady Johanna talked to someone behind her on another world. Then she looked at B'dikkat and commanded, "Just don't name the drug or talk too much about it. Tell me the rest."

"WE HAVE," said B'dikkat very formally, "thirteen hundred and twenty-one people here who can still be counted on to supply parts when the dromozoa implant them. There are about seven hundred more, including Go-Captain Alvarez, who have been so thoroughly absorbed by the planet that it is no use trimming them. The Empire set up this place as a point of uttermost punishment. But the Instrumentality gave secret orders for *medicine* — " he accented the word strangely, meaning super-condamine — "to be issued so that the punishment would be counteracted. The Empire supplies our convicts. The Instrumentality distributes the surgical material."

The Lady Johanna lifted her right hand in a gesture of silence and compassion. She looked around the room. Her eyes came back to the Lady Da. Perhaps she guessed what effort the Lady Da had made in order to remain standing erect while the two drugs, the super-condamine and

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the lifeboat drug, fought within her veins.

"You people can rest. I will tell you now that all things possible will be done for you. The Empire is finished. The Fundamental Agreement, by which the Instrumentality surrendered to the Empire a thousand years ago, has been set aside. We did not know that you people existed. We would have found out in time, but I am sorry we did not find out sooner. Is there anything we can do for you right away?"

"Time is what we all have," said the Lady Da. "Perhaps we cannot ever leave Shayol, because the dromozoa and the *medicine*. The one could be dangerous. The other must never be permitted to be known."

The Lady Johanna Gnade looked around the room. When her glance reached him, B'dikkat fell to his knees and lifted his enormous hands in complete supplication.

"What do you want?" said she.

"These," said B'dikkat, pointed to the mutilated children. "Order a stop on children. Stop it now!" He commanded her with the last cry, and she accepted his command. "And lady — " He stopped, as if shy.

"Yes? Go on."

"Lady, I am unable to kill. It is not in my nature. To work, to help, but not to kill. What do I do with these?" He gestured at the four motionless children on the floor.

"Keep them," she said. "Just keep them."

"I can't," he said. "There's no way to get off this planet alive. I do not have food for them in the cabin. They will die in a few hours. And governments," he added wisely, "take a long, long time to do things."

"Can you give them the *medicine?*"

"No, it would kill them if I give them that stuff first before the dromozoa have fortified their bodily processes."

The Lady Johanna Gnade filled the room with tinkling laughter that was very close to weeping. "Fools, poor fools, and the more fool I! If super-condamine works only *after* the dromozoa, what is the purpose of the secret?"

B'dikkat rose to his feet, offended. He frowned, but he could not get the words with which to defend himself.

The Lady Da, ex-empress of a fallen empire, addressed the other lady with ceremony and force: "Put them outside, so they will be touched. They will hurt. Have B'dikkat give them the drug as soon as he thinks it safe. I beg your leave, my lady. . ."

Mercer had to catch her before she fell.

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"YOU'VE all had enough," said the Lady Johanna. "A storm ship with heavily armed troops is on its way to your ferry satellite. They will seize the medical personnel and find out who committed this crime against children."

Mercer dared to speak. "Will you punish the guilty doctor?"

"*You* speak of punishment," she cried. "You!"

"It's fair. I was punished for doing wrong. Why shouldn't he be?"

"Punish — punish!" she said to him. "We will cure that doctor. And we will cure you too, if we can."

Mercer began to weep. He thought of the oceans of happiness which super-condamine had brought him, forgetting the hideous pain and the deformities on Shayol. Would there be no next needle? He could not guess what life would be like off Shayol. Was there to be no more tender, fatherly B'dikkat coming with his knives?

He lifted his tear-stained face to the Lady Johanna Gnade and choked out the words, "Lady, we are all insane in this place. I do not think we want to leave."

She turned her face away, moved by enormous compassion. Her next words were to B'dikkat. "You are wise and good, even if you are not a human being. Give them all of the drug they can take. The Instrumentality will decide what to do with all of you. I will survey your planet with robot soldiers. Will the robots be safe, cowman?"

B'dikkat did not like the thoughtless name she called him, but he held no offense. "The robots will be all right, ma'am, but the dromozoa will be excited if they cannot feed them and heal them. Send as few as you can. We do not know how the dromozoa live or die."

"As few as I can," she murmured. She lifted her hand in command to some technician unimaginable distances away. The odorless smoke rose about her and the image was gone.

A shrill cheerful voice spoke up. "I fixed your window," said the customs robot. B'dikkat thanked him absentmindedly. He helped Mercer and the Lady Da into the doorway. When they had gotten outside. they were promptly stung by the dromozoa. It did not matter.

B'dikkat himself emerged, carrying the four children in his two gigantic, tender hands. He lay the slack bodies on the ground near the cabin. He watched as the bodies went into spasm with the onset of the dromozoa. Mercer and the Lady Da saw that his brown cow eyes were rimmed with red and that his huge cheeks were dampened by tears.

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Hours or centuries.

Who could tell them apart?

The herd went back to its usual life, except that the intervals between needles were much shorter. The once-commander, Suzdal, refused the needle when he heard the news. Whenever he could walk, he followed the customs robot around as they photographed, took soil samples, and made a count of the bodies. They were particularly interested in the mountain of the Go-Captain Alvarez and professed themselves uncertain as to whether there was organic life there or not. The mountain did appear to react to super-condamine, but they could find no blood, no heart-beat. Moisture, moved by the dromozoa, seemed to have replaced the once-human bodily processes.

V

AND then, early one morning, the sky opened.

Ship after ship landed. People emerged, wearing clothes.

The dromozoa ignored the newcomers. Mercer, who was in a state of bliss, confusedly tried to think this through until he realized that the ships were loaded to their skins with communications machines; the "people" were either robots or images of persons in other places.

The robots swiftly gathered together the herd. Using wheelbarrows, they brought the hundreds of mindless people to the landing area.

Mercer heard a voice he knew. It was the Lady Johanna Gnade. "Set me high," she commanded.

Her form rose until she seemed one-fourth the size of Alvarez. Her voice took on more volume.

"Wake them all," she commanded.

Robots moved among them, spraying them with a gas which was both sickening and sweet. Mercer felt his mind go clear. The super-condamine still operated in his nerves and veins, but his cortical area was free of it. He thought clearly.

"I bring you," cried the compassionate feminine voice of the gigantic Lady Johanna, "the judgment of the Instrumentality on the planet Shayol.

"Item: the surgical supplies will be maintained and the dromozoa will not be molested. Portions of human bodies will be left here to grow, and the grafts will be collected by robots. Neither man nor homunculus will live here again.

"Item: the underman B'dikkat, of cattle extraction, will be rewarded by an immediate return to earth. He will be paid twice his expected thousand years of earnings."

The voice of B'dikkat, without

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amplification, was almost as loud as hers through the amplifier. He shouted his protest, "Lady, Lady!"

She looked down at him, his enormous body reaching to ankle height on her swirling gown, and said in a very informal tone, "What do you want?"

"Let me finish my work first," he cried, so that all could hear. "Let me finish taking care of these people."

The specimens who had minds all listened attentively. The brainless ones were trying to dig themselves back into the soft earth of Shayol, using their powerful claws for the purpose. Whenever one began to disappear, a robot seized him by a limb and pulled him out again.

"Item: cephalectomies will be performed on all persons with irrecoverable minds. Their bodies will be left here. Their heads will be taken away and killed as pleasantly as we can manage, probably by an overdosage of super-condamine."

"The last big jolt," murmured Commander Suzdal, who stood near Mercer. "That's fair enough."

"Item: the children have been found to be the last heirs of the Empire. An over-zealous official sent them here to prevent their committing treason when they grew up. The doctor obeyed orders without questioning them. Both the official and the doctor have been cured and their memories of this have been erased, so that they need have no shame or grief for what they have done."

"It's unfair," cried the half-man. "They should be punished as we were!"

The Lady Johanna Gnade looked down at him. "Punishment is ended. We will give you anything you wish, but not the pain of another. I shall continue.

"Item: since none of you wish to resume the lives which you led previously, we are moving you to another planet nearby. It is similar to Shayol, but much more beautiful. There are no dromozoa."

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AT this an uproar seized the herd. They shouted, wept, cursed, appealed. They all wanted the needle, and if they had to stay on Shayol to get it, they would stay.

"Item," said the gigantic image of the lady, overriding their babble with her great but feminine voice, "you will not have super-condamine on the new planet, since without dromozoa it would kill you. But there will be caps. *Remember the caps.* We will try to cure you and to make people of you again. But if you give up, we will not force you. Caps are very powerful; with medical help you can live under them many years."

A hush fell on the group. In their various ways, they were trying to compare the electrical caps which had stimulated their pleasure-lobes with the drug which had drowned them a thousand times in pleasure. Their murmur sounded like assent.

"Do you have any questions?" said the Lady Johanna.

"When do we get the caps?" said several. They were human enough that they laughed at their own impatience.

"Soon," said she reassuringly, "very soon."

"Very soon," echoed B'dikkat, reassuring his charges even though he was no longer in control.

"Question," cried the Lady Da.

"My Lady . . .?" said the Lady Johanna, giving the ex-empress her due courtesy.

"Will we be permitted marriage?"

The Lady Johanna looked astonished. "I don't know." She smiled. "I don't know any reason why not—"

"I claim this man Mercer," said the Lady Da. "When the drugs were deepest, and the pain was greatest, he was the one who always tried to think. May I have him?"

Mercer thought the procedure arbitrary but he was so happy that he said nothing. The Lady Johanna scrutinized him and then she nodded. She lifted her arms in a gesture of blessing and farewell.

The robots began to gather the pink herd into two groups. One group was to whisper in a ship over to a new world, new problems and new lives. The other group, no matter how much its members tried to scuttle into the dirt, was gathered for the last honor which humanity could pay their manhood.

B'dikkat, leaving everyone else, jogged with his bottle across the plain to give the mountain-man Alvarez an especially large gift of delight.

— **CORDWAINER SMITH**

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Illustrated by BURNS

By ROBERT BLOCH

CRIME MACHINE

For that real deep-down badness, nothing beats the Good Old Days.

"LET HIM alone," said Stephen's father. "It's a phase they all go through. He'll snap out of it."

Stephen didn't really believe he was ever going to snap out of it, but he was grateful that his folks let him alone. He wasn't worried what they thought, just as long as they allowed him to watch the viddies.

Because his father was rich and connected with the university labs, Stephen had his own viddie set. While his parents indulged their normal tastes and watched the adult mush on the wall downstairs, Stephen stayed in his room and his own world.

It was a wonderful world for

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any thirteen-year-old — the world called the Good Old Days. There were all kinds of viddie shows about the golden pioneer era of seventy-five years ago, the marvelous time when heroes like Dion O'Bannion and Hymie Weiss walked the Earth.

Stephen watched a show called *Big Jim* — about Big Jim Colosimo and his lovable friends. He watched *The Enforcer;* that was the one about Frank Nitti. He was a man of action, like the heroes of *Johnny Torrio* and *Legs Diamond*. The *Legs Diamond* show was very exciting, because Legs was the one who always danced his way around the bullets in a gang war. That was how he got his name.

Stephen learned a lot about the people who had lived in the romantic past. He knew about flashy gambling men like fancy Arnold Rothstein, who was so suave, and wild rascals like Bugs Moran. There was a new show out called *The Great Dillinger,* and that was pretty good. But the best of all was Stephen's favorite — *Scarface Al.* No wonder it was right up there on top with all the kids; its hero was Scarface Al Capone, the Robin Hood of Chicago, who took from the rich and gave to the poor.

Lots of times Stephen found himself humming the theme song, which went:

Al Capone, Al Capone,
A mighty man who
walked alone —
Wherever daring deeds
are known,
Men sing the praise of
Al Capone.

Stephen liked the way the machine guns came in on the end of the last line.

But then he liked everything about Al Capone; the way he got his scar — defending his sister from the crooked prohibition agents; the way he disguised himself as "Mr. Brown" when he was fighting the wicked cops and the thieving politicians of Chicago. Stephen knew all about Al Capone, riding in from his hideout in Cicero to bring justice to Chicago and save pretty girls from the evil Vice Squad men.

Stephen joined the "Scarface Al Club" and ate enough cereal to get himself the complete prize outfit — the artificial scar to wear, the bulletproof vest and everything.

He might have been a very happy boy if he hadn't found his uncle's subjectivity reactor.

IT WAS a big machine, resembling nothing quite so much as the genetic control, which his uncle had also invented. The genetic control was a large box in which a woman could sit and

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be bombarded by radiations which would eradicate recessive and undesirable traits in her ova, thus leading to the reproduction of healthy offspring. This apparatus, marketed under the popular name of "Heir Conditioner," was an immediate success because it was a failure. Nothing really happened, but the woman who used it felt better; in that respect it resembled a face cream and had the additional advantage of being much more expensive.

The machine which Stephen found — the subjectivity reactor — was a failure because it was a success. Not an immediate failure, for it was never manufactured or marketed, but a gradual failure. His uncle had devised it while still a young man, many years ago, and it too was a large box which contained a variety of mechanisms. Under their stimulus, the subject became capable of materializing, in tangible three-dimensional form, his immediate thought patterns.

The gradual failure came about because his uncle had experimented upon himself, and pretty soon his home was overflowing with tangible three-dimensional forms to which his wife objected; most particularly to the redheads.

Consequently the subjectivity reactor was carted off to the storage building behind the university labs where Stephen's uncle and father both worked, and no one ever mentioned that it was also capable, by virtue of the same principle of materializing thought, of acting as a time machine.

Stephen himself found it out by accident one day when he was playing around, exploring the deserted warehouse premises. He noticed the boxlike apparatus and crawled inside, pretending for the moment that he was a hero like Pretty-Boy Floyd, hiding out from the dirty old Feds. He didn't pay much attention to the blinking lights and whirling mirrors which became self-activating the moment he stepped inside and closed the door; he was wishing he had a gat to protect himself in case that archfiend J. Edgar Hoover showed up. He'd show him!

"All right, copper — you asked for it." And he'd reach in his pocket and pull out his gat, like this, and —

Stephen felt the weight before he saw it. And then he *did* pull his hand out of his pocket and he *was* holding a gat. A real roscoe, a genuine equalizer. Stephen stared at it, his thoughts whirling faster than the mirrors.

The gun — where did it come from? He'd just thought about it and it was here; how could that be? Actually, he hadn't even

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thought, just *wished.* The way he wished he had been around back in the Good Old Days, the way he was wishing now. He'd give anything to see real live American History in the making, like that morning of St. Valentine's Day in the garage on Clark Street . . .

THE MIRRORS revved faster and suddenly they disappeared. Everything disappeared. It was like a viddie dissolve, so Stephen wasn't frightened. He knew the next scene would come up right after the commercial. Only this wasn't viddie and there was no commercial. The next scene came up when the blurring stopped and he found himself sitting in the same box, the mirrors still whirring and he heard the noise outside. Stephen blinked, tugged at the door of

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the compartment, opened it, and saw the machine guns spit.

He knew where he was now. He'd seen it a dozen times on viddie, imagined it a thousand more. The garage, at eleven o'clock in the morning; the two executioners disguised in the uniforms of the hated police were mowing down the seven finks.

Stephen, in the subjectivity reactor, had materialized at the very instant the firing started. For thirty seconds Stephen stared at the finks as they writhed and fell. And during those thirty seconds the finks became men. Men who wriggled and flopped after the bullets struck, until the two swarthy hoods in uniform stepped up and completed their work with revolvers. There was blood on the wall and floor, and a terrible, acrid odor. The two men noticed it, too, and commented harshly in Italian. One of them laughed and spat on the floor.

Stephen wasn't laughing and he felt that unless he got out of here right away he'd do more than spit. He started to close the door and it was then that the executioners looked up and saw him.

"What the hell —" said the short one, and raised his revolver. His taller companion slapped it out of his hand.

"Wait," he said He stooped, picked up the machine gun, and faced Stephen in the doorway of the compartment "Awright, kid, how you get in here? Where you come from?" He raised the muzzle of his weapon. "C'mon, talk!"

Stephen talked. It was hard to, with the choking in his throat as he watched the machine gun muzzle that was like a cruel mouth — almost as cruel as the mouth of the man who held it.

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It was hard to explain, too, and he wasn't sure he understood the situation himself. Certainly the shorter assassin didn't understand, because he nudged his companion and said, "He's nuts! Hurry up and give it to him — we gotta get outa here!"

The big man with the machine gun shook his head. "Shaddup and listen. Dincha hear? This thing goes through time. It's a time machine. Aincha never heard?"

"*Porko Dio!* No such thing —"

"No such thing now." The big man nodded. "But maybe they invent it later on. That's where this kid comes from. How else you figure he got here if not like that?"

"So?"

"So you wanna get outa here, right?"

"Sure, to St. Louis. That's where Al said we'd get the payoff —"

"You know what kinda payoff we end up with." The big man made a nasty noise in his throat. "But suppose we *really* get out. Suppose we go back with the kid here."

He took a step forward. "Awright, kid, whaddya say?" He stared at Stephen.

STEPHEN stared back, into his face and the face of his companion. Here was his chance to take two real live gangsters back into his own world, his own time. It was something he'd always dreamed of. Only he had never dreamed they really looked and talked like this. And he had never dreamed the reality he glimpsed over their shoulders; the torn, huddled, oozing reality on the garage floor. Now he knew all there was to know about the Good Old Days.

The big man raised his weapon. "Hurry up! We ain't got all day. Whaddya say?"

Stephen knew he himself didn't have all day, or even another minute. Fortunately, thanks to the viddies, he knew what to say and how to say it. His hand squeezed the trigger inside his coat pocket. First the small man went down and then the big man.

As the big man fell there was a short, staccato burst from the machine gun. Several bullets punctured the shell of the compartment. But by this time Stephen had slammed the door of the subjectivity reactor and hurled himself to the floor in quivering panic, wishing with all his being that he was back where he belonged . . .

He might have had a hard time explaining the presence of the gat if he hadn't wished so strongly that it would disappear. As it was, he emerged from the subjectivity reactor completely

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unscathed. To all intents and appearances, Stephen was unchanged by his experience.

The thing of it was that from then on he never watched *Scarface Al* any more.

"He's growing up," his mother said proudly.

"What did I tell you?" his father said. "I knew he'd get over it. All it takes is time."

When he said, "All it takes is time," he suddenly remembered Stephen's visit to the old storage building. That night he made a trip there himself to confirm his suspicions.

And there, as he expected, he found the subjectivity reactor — and the telltale impressions left by the machine-gun bullets.

Funny thing, they didn't penetrate with half the force of the old Colt .45s. Stephen's father stopped until he found the holes near the bottom of the machine. Stephen's father remembered the day *those* shots had been fired.

Sometime he'd have to tell Stephen. Tell him how it was when *he* was a boy, when the machine had first been invented. Like father, like son.

Stephen's father gazed at the Colt bullet holes and smiled reminiscently. He too had had his viddie heroes in his youth. Only *his* personal favorite happened to be the *real* 1870 Wyatt Earp.

— ROBERT BLOCH

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The creature from Venus didn't know right from left — and life and death hung in the balance!

AMATEUR IN CHANCERY

By GEORGE O. SMITH

PAUL Wallach came into my office. He looked distraught. By some trick of selection, Paul Wallach, the director of Project Tunnel, was one of the two men in the place who did not have a string of doctor's and scholar's degrees to tack behind their names. The other was I.

"Trouble, Paul?" I asked.

He nodded, saying, "The tunnel car is working."

"It should. It's been tested enough."

"Holly Carter drew the short straw."

"Er —" I started and then stopped short as the implication became clear. "She's — she's — not —?"

"Holly made it to Venus all right," he said. "Trouble is we can't get her back."

"Can't get her back?"

He nodded again. "You know, we've never really known very much about the atmosphere of Venus."

"Yes."

"Well, from what little came through just before Holly blacked out, it seems that there must be one of the cyanogens in the atmosphere in a concentration high enough to effect nervous paralysis."

"Meaning?"

"Meaning," said Paul Wallach in a flat tone, "that Holly Carter stopped breathing shortly after

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she cracked the airlock. And her heart stopped beating a minute or so later."

"Holly — dead?"

"Not yet, Tom," he said. "If we can get her back in the next fifteen or twenty minutes, modern medicine can bring her back."

"But there'll be brain damage!"

"Oh, there may be some temporary impairment. Nothing that retraining can't restore. The big problem is to bring her back."

"We should have built two tunnel cars."

"We should have done all sorts of things. But when the terminal rocket landed on Venus, everybody in the place was too anxious to try it out. Lord knows, I tried to proceed at a less headlong pace. But issuing orders to you people is a waste of time and paper."

I looked at him. "Doc," I asked, giving him the honorary title out of habit, "Venus is umpty-million miles from here. We haven't another tunnel car, and no rocket could make it in time to do any good. So how can we hope to rescue Holly?"

"That's the point," said Wallach. "Venus, it appears, is inhabited."

"Oh?"

"That's what got Holly caught in the first place. She landed, then saw this creature approaching. Believing that no life could exist in an atmosphere dangerous to life, she opened the airlock and discovered otherwise."

"So?"

"So now all we have to do is to devise some way of explaining to a Venusian the difference between left and right. I thought you might help."

"But I'm just a computer programmer."

"That's the point. We all figured that you have developed a form of communication to that machine of yours. The rest of the crew, as you know, have a bit of difficulty in communicating among themselves in their own jargon, let alone getting through to normal civilians. When it comes to a Venusian, they're licked."

I said, "I'll try."

PROJECT Tunnel is the hardware phase of a program started a number of years ago when somebody took a joke seriously.

In a discussion of how the tunnel diode works, one of the scientists pointed out that if an electron could be brought to absolute rest, its position according to Heisenberg Uncertainty would be completely ambiguous. Hence it had as high a possibility of being found on Venus as it had of being found on Earth or anywhere else. Now, the tunnel diode makes use of this effect by a

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voltage bias across the diode junction. Between narrow limits, the voltage bias is correct to upset the ambiguity of Mr. Heisenberg, making the electron nominally found on one side of the junction more likely to be found on the other.

Nobody could deny the operability of the tunnel diode. Project Tunnel was a serious attempt to employ the tunnel effect in gross matter.

The terminal rocket mentioned by Paul Wallach carried the equipment needed to establish the voltage bias between Venus and the Earth. Once established, Project Tunnel was in a state that caused it to maroon the most wonderful girl in the world.

Since the latter statement is my own personal opinion, my pace from the office to the laboratory was almost a dead run.

The laboratory was a madhouse. People stood in little knots, arguing. Those who weren't talking were shaking their heads in violent negation.

The only one who appeared unupset was Teresa Dwight, our psi-girl. And here I must confess an error. When I said that Paul Wallach and I were the only ones without a string of professorial degrees, I missed Teresa Dwight. I must be forgiven. Teresa had a completely bland personality, zero drive, and a completely unstartling appearance. Teresa was only fourteen. But she'd discovered that her psi-power could get her anything she really wanted. Being human, therefore, she did not want much. So forgive me for passing her by.

But now I had to notice her. As I came in, she looked up and said, "Harla wants to know why can't he just try."

WALLACH went white. "Tell that Venusian thing 'NO!' as loud as you can."

Teresa concentrated, then asked, "But why?"

"Does this Harla understand the Heisenberg Effect?"

She said after a moment, "Harla says he has heard of it as a theory. But he is not quite prepared to believe that it does indeed exist as anything but an abstract physical concept."

"Tell Harla that Doctor Carter's awkward position is a direct result of our ability to reduce the tunnel effect to operate on gross matter."

"He realizes that. But now he wants to know why you didn't fire one of the lower animals as a test."

"Tell him that using animals for laboratory experiments is only possible in a police state where the anti-vivisection league can be exiled to Siberia. Mink coats and all. And let his Venusian mind

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make what it can of that. Now, Teresa —"

"Yes?"

"Tell Harla, very carefully, that pressing the left-hand button will flash the tunnel car back here as soon as he closes the airlock. But tell him that pushing the right-hand button will create another bias voltage — whereupon another mass of matter will cross the junction. In effect, it will rip a hole out of this laboratory near the terminal, over there, and try to make it occupy the same space as the tunnel car on Venus. None of us can predict what might happen when two masses attempt to occupy the same space. But the chances are that some of the holocaust will backfire across the gap and be as violent at this end, too."

"Harla says that he will touch nothing until he has been assured that it is safe."

"Good. Now, Tom," he said, addressing me, "how can we tell right from left?"

"Didn't you label 'em?"

"They're colored red on the right and green on the left."

"Is Harla color-blind?"

"No, but from what I gather Harla sees with a different spectrum than we do. So far as he is concerned both buttons look alike."

"You could have engraved 'em 'COME' and 'GO'."

Frank Crandall snorted. "Maybe you can deliver an 'English, Self-Taught' course through Teresa to the Venusian?"

I looked at Crandall. I didn't much care for him. It seemed that every time Holly Carter came down out of her fog of theoretical physics long enough to notice a simpleton who had to have a machine to perform routine calculations, we were joined by Frank Crandall who carted her off and away from me. If this be rank jealousy, make the most of it. I'm human.

"Crandall," I said, "even to a Hottentot I could point out that the engraved legend 'GO' contains two squiggly symbols, whereas the legend 'RETURN' contains 'many'."

WALLACH stepped into the tension by saying, "So we didn't anticipate alien life. But now we've got the problem of communicating with it."

Crandall didn't appear to notice my stiff reply. He said, "Confound it, what's missing?"

"What's missing," I told him, "is some common point of reference."

"Meaning?"

"Meaning that I could define left from right to any semi-intelligent human being who was aware of the environment in which we live."

"For example?"

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I groped for an example and said, lamely, "Well, there's the weather rule, valid for the northern hemisphere. When the wind is blowing on your back, the left hand points to the low pressure center."

"Okay. But how about Venus? Astronomical information, I mean."

I shook my head.

"Why not?" he demanded. "If we face north, the sun rises on our right, doesn't it?"

"Yes. Even in the southern hemisphere."

"Well, then. So it doesn't make any difference which hemisphere *they're in.*"

"You're correct. But you're also making the assumptions that Venus rotates on its axis, that the axis is aligned parallel to the Earth's and that the direction of rotation is the same."

"We know that Venus rotates!"

"We have every reason to believe so," I agreed. "But only because thermocouples measure a temperature on the darkside that is too high to support the theory that the diurnal period of Venus is equal to the year. I think the latest figures say something between a couple of weeks and a few months. Next, the axis needn't be parallel to anything. Shucks, Crandall, you know darned well that the solar system is a finely made clock with no two shafts aligned, and elliptical gears that change speed as they turn."

"PRACTICALLY everything in the solar system rotates in the same direction."

I looked at him. "Would you like to take a chance that Venus agrees with that statement? You've got a fifty percent chance that you'll be right. Guess wrong and we have a metric ton of hardware trying to occupy the same space as another metric ton of matter."

"But —"

"And furthermore," I went on, "we're just lucky that Polaris happens to be a pole star right now. The poles of Mars point to nothing that bright. Even then, we can hardly expect the Venusian to have divided the circumpolar sky into the same zoo full of mythical animals as our forebears — and if we use the commonplace expression, maybe the Venusian never paused to take a long-handled dipper of water from a well. Call them stewpots and the term is still insular. Sure, there's lots of pointers, but they have to be identified. My mother always insisted that the Pleiades were — er — was the Little Dipper."

Teresa Dwight spoke up, possible for the second or third time in her life without being spoken to first. She said, "Harla has been listening to you through me. Of

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astronomy he has but a rudimentary idea. He is gratified to learn from you that there is a 'sun' that provides the heat and light. This has been a theory based upon common sense; *something* had to do it. But the light comes and goes so slowly that it is difficult to determine which direction the sun rises from. The existence of other celestial bodies than Venus is also based on logic. If, they claim, they exist, and their planet exists, then there probably are other planets with people who cannot see them, either."

"Quoth Pliny the Elder," mumbled Paul Wallach.

I looked at him.

"Pliny was lecturing about Pythagoras' theory that the Earth is round. A heckler asked him why the people on the other side didn't fall off. Pliny replied that on the other side there were undoubtedly fools who were asking their wise men why we didn't fall off."

"It's hardly germane," I said.

"I'm sorry. Yes. And time is running out."

THE laboratory door opened to admit a newcomer, Lou Graham, head of the electronics crew.

He said, "I've got it!"

The chattering noise level died out about three decibels at a time. Lou said, "When a steel magnet is etched in acid, the north pole shows selective etching!"

I shook my head. "Lou," I said, "we don't know whether Venus has a magnetic field, whether it is aligned to agree with the Earth's — nor even whether the Venusians have discovered the magnetic compass."

"Oh, that isn't the reference point," said Lou Graham. "I'm quite aware of the ambiguity. The magnetic field does have a vector, but the arrow that goes on the end is strictly from human agreement."

"So how do you tell which is the north pole?"

"By making an electromagnet! Then using Ampere's Right Hand Rule. You grasp the electromagnet in the right hand so that the fingers point along the winding in the direction of the current flow. The thumb then points to the north pole."

"Oh, fine! Isn't that just the same confounded problem? Now we've got to find out whether Harla is equipped with a right hand complete with fingers and thumbs — so that we can tell him which his right hand is!"

"No, no," he said. "You don't understand, Tom. We don't need the right hand. Let's wind our electromagnet like this: We place the steel bar horizontally in front of us. The wire from 'Start' leaves us, passes over the top of the

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bar, drops below the bar on the far side, comes toward us on the under side, rises above the bar on the side toward us, and so on around and around until we've got our electromagnet wound. Now if the 'start' is positive and the 'end' is negative, the north pole will be at the left. It will show the selective etching in acid."

I looked at him. "Lou," I said slowly, "if you can define positive and negative in un-ambiguous terms as well as you wound that electromagnet, we can get Holly home. Can you?"

Lou turned to Teresa Dwight. "Has this Harla fellow followed me so far?"

She nodded.

"Can you speak for him?"

"You talk, I hear, he reads me. I read him and I can speak."

"OKAY, then," said Lou Graham. "Now we build a Le Clanche cell. Ask Harla does he recognize carbon. A black or light-absorbing element. Carbon is extremely common, it is the basis of life chemistry. It is element number six in the periodic chart. Does Harla know carbon?"

"Harla knows carbon."

"Now we add zinc. Zinc is a light metal easily extracted from the ore. It is fairly abundant, and it is used by early civilizations for making brass or bronze long before the culture has advanced enough to recognize zinc as an element. Does Harla know zinc?"

"He may," said Teresa very haltingly. "What happens if Harla gets the wrong metal?"

"Not very much," said Lou. "Any of the light, fairly plentiful metals that are easily extracted from the ore will suffice. Say tin, magnesium, sodium, cadmium, so on."

"Harla says go on."

"Now we make an electrolyte. Preferably an alkaline salt."

"Be careful," I said. "Or you'll be asking Harla to identify stuff from a litmus paper."

"No," said Lou. He faced Teresa and said, "An alkaline substance burns the flesh badly."

"So do acids," I objected.

"Alkaline substances are found in nature," he reminded me. "Acids aren't often natural. The point is that an acid will work. Even salt water will work. But an alkaline salt works better. At any rate, tell Harla that the stuff, like zinc, was known to civilized peoples many centuries before chemistry became a science. Acids, on the other hand, are fairly recent."

"Harla understands."

"Now," said Lou Graham triumphantly, "we make our battery by immersing the carbon and the zinc in the electrolyte. The carbon is the positive electrode

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and should be connected to the start of our electromagnet, whereas the end of the winding must go to the zinc. This will place the north pole to the left hand."

"Harla understands," said Teresa. "So far, Harla can perform this experiment in his mind. But now we must identify which end of the steel bar is north-pole magnetic."

"If we make the bar magnetic and then immerse it in acid, the north magnetic pole will be selectively etched."

"Harla says that this he does not know about. He has never heard of it, although he is quite familiar with electromagnets, batteries, and the like."

I looked at Lou Graham. "Did you cook this out of your head, or did you use a handbook?"

He looked downcast. "I did use a handbook," he admitted. "But — "

"Lou," I said unhappily, "I've never said that we couldn't establish a common frame of reference. What we lack is one that can be established in minutes. Something physical—" I stopped short as a shadowy thought began to form.

PAUL Wallach looked at me as though he'd like to speak but didn't want to interrupt my train of thoughts. When he could contain himself no longer, he said, "Out with it, Tom."

"Maybe," I muttered. "Surely there must be something physical."

"How so?"

"The tunnel car must be full of it," I said. "Screws?"

I turned to Saul Graben. Saul is our mechanical genius; give him a sketch made on used Kleenex with a blunt lipstick and he will bring you back a gleaming mechanism that runs like a hundred-dollar wrist watch.

But not this time. Saul shook his head.

"What's permanent is welded and what's temporary is snapped in with plug buttons," he said.

"Good Lord," I said. "There simply *must* be something!"

There probably is," said Saul. "But this Harla chap would have to use an acetylene torch to get at it."

I turned to Teresa. "Can this psi-man Harla penetrate metal?"

"Can anyone?" she replied quietly.

Wallach touched my arm. "You're making the standard, erroneous assumption that a sense of perception will give its owner a blueprint-clear grasp of the mechanical details of some machinery. It doesn't. Perception, as I understand it, is not even similar to eyesight."

"But — " I fumbled on —

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"surely there must be some common reference there, even granting that perception isn't eyesight. So how does perception work?"

"Tom, if you were blind from birth, I could tell you that I have eyesight that permits me to see the details of things that you can determine only by feeling them. This you might understand basically. But you could never be made to understand the true definition of the word 'picture' nor grasp the mental impression that is generated by eyesight."

"Well," I persisted, "can he penetrate flesh?"

"Flesh?"

"Holly's heart has stopped," I said. "But it hasn't been removed. If Harla can perceive through human flesh, he might be able to perceive the large, single organ in the chest cavity near the spine."

Teresa said, "Harla's perception gives him a blurry, incomplete impression," She looked at me. "It is something like a badly out-of-focus, grossly under-exposed x-ray solid."

"X-ray solid?" I asked.

"It's the closest thing that you might be able to understand," she said lamely.

I dropped it right there. Teresa had probably been groping in the dark for some simile that would convey the nearest possible impression. I felt that this was going to be the nearest that I would ever get to understanding the sense of perception.

"Can't he get a clear view?"

"He has not the right."

"Right!" I exploded. "Why—"

Wallach held up his hand to stop me. "Don't make Teresa fumble for words, Tom. Harla has not the right to invade the person of Holly Carter. Therefore he can not get a clearer perception of her insides."

"Hell!" I roared. "Give Harla the right."

"No one has authority."

"Authority be dammed!" I bellowed angrily. "That girl's life is at stake!"

WALLACH nodded unhappily. "Were this a medical emergency, a surgeon might close his eyes to the laws that require authorization to operate. But even if he saved the patient's life, he is laying himself open to a lawsuit. But this is different, Tom. As you may know, the ability of any psi-person is measured by their welcome to the information. Thus Teresa and Harla, both willing to communicate, are able."

"But can't Harla understand that the entire bunch of us are willing that he should take a peek?"

"Confound it, Tom, it isn't a matter of our permission! It's

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a matter of fact. It would ease things if Holly were married to one of us, but even so it wouldn't be entirely clear. It has to do with the invasion of privacy."

"Privacy? In this case the very idea is ridiculous."

"Maybe so," said Paul Wallach. "But I don't make the rules. They're *natural* laws. As immutable as the laws of gravity or the refraction of light. And Tom, even if I were making the laws I might not change things. Not even to save Holly Carter's life. Because, Tom, if telepathy and perception were as free and unbounded as some of their early proponents claimed, life would be a sheer, naked hell on earth."

"But what has privacy to do with it? This Harla isn't at all humanoid. A cat can look at a king —"

"Sure, Tom. But how long would the cat be permitted to read the king's mind?"

I grunted. "Has this Harla any mental block about examining the outside?"

He looked at me thoughtfully. "You're thinking about a scar or some sort of blemish?"

"Yes. Birthmark, maybe. No one is perfect."

"You know of any?"

I thought.

It was not hard for me to conjure up a picture of Holly Carter. Unfortunately, I looked at Holly Carter through the eyes of love, which rendered her perfect. If she had bridgework, I hadn't found it out. Her features were regular and her hair fell loose without a part. Her complexion was flawless . . . at least the complexion that could be examined whilst Holly sunned herself on a deck chair beside the swimming pool.

I shook my head. Then I faced an unhappy fact. It hurt, because I wanted my goddess to be perfect, and if she were made of weak, mortal flesh, I did not want to find it out by asking the man who knew her better than I did.

Still, I wanted her alive. So I turned to Frank Crandall.

"Do you?" I asked.

"Do I what?"

"Know of any scars or birthmarks?"

"Such as?"

"Oh, hell," I snapped. "Such as an appendix scar that might be used to tell left from right."

"Look, Tom, I'm not her physician, you know. I can only give you the old answer: 'Not until they wear briefer swim suits.'"

My heart bounced lightly. That Holly was still in mortal danger was not enough to stop my elation at hearing Frank Crandall admit that he was not Holly's lover, nor even on much better terms than I. It might have been better to face the knowledge that Holly was all woman and all

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human even though the information had to come from someone who knew her well enough to get her home.

Then I came back to earth. I had my perfect goddess — in deadly peril — instead of a human woman who really did not belong to any man.

I HADN'T seen Saul Graben, leave, but he must have been gone because now he opened the door and came back. He was carrying a heavy rim gyroscope that was spinning in a set of frictionless gymbals. He looked most confused.

He said, "I've spent what seems like an hour. You can't tell me that this gizmo is inseparable from the selfish, insular intellect of terrestrial so-called homo sapiens."

He turned the base and we all watched the gymbal rings rotate to keep the gyro wheel in the same plane. "It should be cosmic," he said. "But every time I start, I find myself biting myself on the back of the neck. Look. If you make the axle horizontal in front of you and rotate the gyro with the top edge going away from you, you can define a common reference. But motion beyond that cannot be explained. If the axle is depressed on the right side, the gyro will turn so the far edge looks to the right. But that's defining A in terms of A. So I'm licked."

Frank Crandall shook his head. "There's probably an absolute to that thing somewhere, but I'm sure none of us know it. We haven't time to find it. In fact, I think the cause is lost. Maybe we'd better spend our time figuring out a plausible explanation."

"Explanation?" blurted Wallach.

"Let's face it," said Crandall. "Holly Carter's life is slipping away. No one has yet come close to finding a common reference to describe right from left to this Harla creature."

"So what's your point?"

"Death is for the dying," Crandall said in a monotone. "Let them have their hour in peace and dignity. Life is for the living, and for the living there is no peace. We who remain must make the best of it. So now in about five minutes Holly will be at peace. The rest of us have got to answer for her."

"How do you mean?"

"How do you propose to explain this unfortunate incident?" asked Crandall. "Someone will want to know what happened to the remains of Holly Carter. I can see hell breaking loose. And I can see the whole lot of us getting laughed right off the Earth because we couldn't tell right from left. And I can see us all clob-

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bered for letting the affair take place."

"You seem to be more worried about your professional reputation than about Holly Carter's life!"

"I have a future," he said. "Holly doesn't seem to. Hell," he groaned, "we can't even gamble on it."

"Gamble?"

"How successful do you think you'd be in getting this Venusian to risk his life by closing his eyes and making a fifty-fifty stab in the dark at one of those buttons?"

"Well — " started Wallach — "we'd be gambling too, you know. But — "

WAIT a moment," I said. "I've got a sort of half-cracked theory. May I try?"

"Of course."

"Not 'of course.' I'll have to have quiet, with just Teresa to communicate through."

"If you have any ideas, try them," said Wallach.

"Do you really know what you're doing?" demanded Frank Crandall.

"I think so," I replied. "If it works, it'll be because I happen to feel close to Holly."

"Could be," he said with a shrug. I almost flipped. Duels have been fought over less. But instead of taking offense, Crandall topped it off by adding, "You could have been a lot closer if you'd tried. She always said you had the alert, pixie-type mind that was pure relaxation instead of a dead let-down after a period of deep concentration. But you were always scuttling off somewhere. Well, go ahead and try, Tom. And good luck!"

I took a deep breath.

"Teresa?" I asked.

"Yes, Mr. Lincoln?"

"Tell Harla to concentrate on the buttons."

"He is."

"There is a subtle difference between them."

"This he knows, but he does not know what it is."

"There is a delicate difference in warmth. One button will be faintly warmer than the other."

"Harla has felt them."

I dropped the third-person address and spoke to Teresa as if she were but one end of a telephone line. "Harla," I said, "only part of the difference lies in the warmth to physical touch. There should be another kind of warmth. Are you not affected by a *feeling* that one is better than the other?"

Harla's reply came direct through Teresa: "Why yes, I am indeed drawn to the warmer of the two. Were this a game I would wager on it. But that is emotion and hardly suitable as a guide."

"Ah, but it is!" I replied

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quickly. "This is our frame of reference. Press the warmer of the but—"

I was violently interrupted. Wallach shook me violently and hurled me away from Teresa. Frank Crandall was facing the girl, shouting, "No! No! The warm one will be the red one! You must press the green — "

And then he, too, was interrupted.

Displaced air made a near-explosive *woosh!* and the tunnel car was there on its pad. In it was a nightmare horror holding a limp Holly Carter across its snakelike tentacles. A free tentacle opened the door.

"Take her while I hold my breath," said Harla, still talking through Teresa. "I'll return the tunnel car empty. I can, now that I know that warmth is where the hearth is."

Harla dropped the unconscious girl in my arms and snapped back into the car. It disappeared, then returned empty just as the doctor was bending over Holly.

SO now I have my Holly, but every now and then I lie awake beside her in a cold sweat. Harla could have guessed wrong. Just as Wallach and Crandall had been wrong in assuming the red button would be warmer than the green. Their reaction was as emotional as Harla's.

I hope Harla either forgives me or never finds out that I had to sound sure of myself, and that I had to play on his emotions simply to get him to take the fifty-fifty chance on his — hers — *our* lives.

And I get to sleep only after I've convinced myself that it was more than chance . . . that somehow our feelings and emotions guided Harla where logic and definition fail.

For right and left do not exist until terrestrial man defines them.

— GEORGE O. SMITH

★ ★ ★ ★ ★

You Still Have Time . . .

(if you were properly prompt in picking up this issue!) to get in your reservation for the World Science Fiction Convention. The place: Seattle, Washington. The date: Labor Day Weekend. The address to mail your $2 registration fee to: P. O. Box 1365, Broadway Station, Seattle 2, Washington. It's your chance to meet, greet and vote for your favorites in the science-fiction field. *Everyone* is welcome. See you there?

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Every army has one like him. He doesn't win wars—
but he can make sure the right people lose them!

THE ABOMINABLE EARTHMAN

By FREDERIK POHL Illustrated by DICK FRANCIS

ONE night when I was C.Q. at the 549th, the Officer of the Day came in, swearing, with a tall, dark-skinned private wandering sullenly along behind him.

We were up to our eyeballs in frantic work; Trenton had just been evacuated. "Get me the M.P. barracks," yelled the O.D. "What do you think? This rat's been selling rations to the civilians." That was Lt. Lauchheimer, who was a pale young man with enormous integrity. He looked at the prisoner as if he wanted to kick him. I could understand that.

The prisoner looked back at him calmly, without very much interest at all. He leaned back against the wall, put one elbow on the hammering teletype and sighed. Behind him was a poster of a great green bug being bayoneted by an American infantryman, captioned:

SIRIANS, GO HOME!

"Sit down," snapped Lt. Lauchheimer, "— you. Whatever the hell you said your name was."

"He's Private Postal, sir," I said reluctantly. "Pinkman W. Postal."

The prisoner looked at me for the first time. The orderly room was full and bustling, so it wasn't

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surprising he hadn't noticed me. "Oh. Hello, Harry."

I dialed the M.P. barracks without answering him, but it was already too late. When I handed the phone to Lt. Lauchheimer he glared at me. I said, "We took basic together, Lieutenant. We, uh — We weren't very close buddies."

"Sergeant, I didn't ask you."

I listened while he was talking on the phone, although I was supposed to be checking casualty reports resulting from the morning's assault on the Sirian bubble. It seemed that Pinky had been given a truckload of supplies for evacuees and told to deliver it to a relief center in Bound Brook. They'd picked him up in New Brunswick with the supplies gone and a pocketful of cash. It was about what I would have expected.

The M.P. jeep was there in less than five minutes, and Lt. Lauchheimer escorted Pinky out without another word to me. But he didn't forget. Two weeks later, when we were packing up for the move to Staten Island, he was in charge of my section and he put me on every rough detail he could think of. I guess I didn't blame him. I would have done the same. He didn't know me very well, but he knew I knew Pinky Postal.

Lauchheimer didn't get off my back until the Boston Retreat, when we were bombed-in together for twelve hours and had a chance to talk things over. After that we were pretty close. He asked me to come along when he volunteered for the Worcester booby-trapping mission that almost worked, which I did, so in a way you might say that Pinky Postal was responsible for my getting the Congressional Medal of Honor.

I'm glad I got it. There were fifteen awarded that day, including mine and Lauchheimer's. They lined us up alphabetically, and my name begins with a "W". So, although my Medal looks like all the others, it's pretty special. It was the last one issued. After that the Sirians englobed Washington.

WHEN Pinky Postal got his bright notion of selling GI canned milk in New Brunswick he was twenty-three years old. He had been drafted at nineteen, out of Cincinnati.

He hated it — hated both. He hated being drafted; and he hated Cincinnati. He had never done a day's work. He liked to drive around down in Kentucky and try to pick up girls, but he was a poor man's son. The girls were not usually impreseed by his wobbly old Ford. In basic training his unmade bed cost the whole platoon a weekend pass at

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Saturday inspection, so the platoon gave him a bit of a hazing. He wasn't hurt. But the next day he went AWOL.

He got as far as the railroad station. He spent the rest of the eight-week training cycle cleaning latrines after duty hours, and our platoon had the dirtiest latrines on the post.

By the time the Sirians landed three years later Postal should have been out of the Army, except that he never stopped trying. He fought the Army with everything he had. A warrant officer called him a Dutch mudheel — well, something like that — and Pinky hit him. That was three months in the guardhouse with forfeiture of pay. A mess sergeant got somehow in the way of a toppling vat of boiling dried limas after a few words with Pinky, who had been on KP. The court-martial called it deliberate assault with intent to maim. While he was awaiting trial for that he got out of the stockade and went AWOL again, and . . . add it up yourself; he had enough bad time to keep him in as long as they wanted him; and he was still trying to make it up when the Sirians blew their bubble around Wilmington.

Pinky couldn't have cared less.

They weren't shooting at him, were they? So what difference did it make to Pinky? What was there to choose between a hopelessly inimical government of human beings, whose rules were beyond him, and a hopelessly alien government of green-chitoned bugs, whose rules were never explained?

The difference was too small for Pinky to bother with. Pinky was as much an alien as the Sirians, in his unattractive, angle-shooting way.

But the Army still thought of him as a soldier, after all. In the massive redeployment that tried to put an armed perimeter around the bubble, Pinky found himself put to work. He hated that most of all.

We were throwing everything we had at the Sirians. The troops in Delaware and Maryland lived in lead suits for a month because we tried to break in with hydrogen bombs. All we accomplished was to kill off every green thing and wild animal for forty miles south of Wilmington. The bubble didn't even bend, and the troops got plenty of chance to become pretty foul inside those suits. I remember it very well; I was one of them.

So was Pinky but, heavens knows how, he managed to get sent north. He was supposed to be driving a truck again in the evacuation of Philadelphia. The place he was evacuating was Bryn Mawr, and probably he mistook

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the girls' panic for another kind of excitement. They screamed to the colonel. Pinky wound up in a punishment battalion once more, and there he met the missionary from inside the bubble, an exile from Eden.

"GIVE IT to me straight, Rocco. What's it like in the bubble?"

"Go to hell."

"Come on, Rocco! Look, you don't like working in the boiler room, do you? Maybe I know how we can cut out of here."

"Shut up, Postal. The sergeant's looking at us."

Vindictively Pinky turned the steam valve a moment before Rocco was ready for it. The high-temperature jet barely missed boiling his fingers.

"What the hell did you do that for? Get off my back, Postal!"

"Come on. What's it like?"

"Shut up, you two! Drag tail!"

Pinky sulked. The job of delousing refugee clothing took two men, one to lift the hundred-pound bundles in and out of the steam boiler, one to turn the valve. Pinky was twice the size of the little ex-prisoner of the Sirians, but it was Pinky who sat at ease with one gloved hand on the valve.

"Don't you want to get out of here?"

"Look, Postal. They won't take me back. Now leave me alone, will you?"

". . . Well, what's it like? Do they feed you?"

"Sure."

"Work you hard?"

The little man said dreamily, "There's a stud farm down in Delaware. Fifteen hundred women, they say. Only a couple dozen men. For breeding, see?"

"Breeding? You mean —"

"They're growing slaves, I guess. Well, I was working on a farm and they closed that up. I got friendly with the overseer and he put me in for the breeding farm. Plenty of food. Nothing else to do. I —"

"I'm warnin' you two! For the last time."

But then, after the last smelly, flea-ridden bale had come out of the sterilizer, Pinky had a chance for one more word with the missionary. Why couldn't he go back?

"Postal, I don't want to talk about it. They threw me out. I was all set, passed the overseers, right up to one of the bugs. He — He said I was too little. They don't want anybody under six feet tall."

Back in the barracks, Pinky slipped out of his dirty GI shoes and painstakingly marked his height off on the wall. The tape measure showed that nothing had changed. He was exactly six feet, one and a quarter inches tall.

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II

ALTOGETHER there were six Sirian ships that landed on the Earth — two in Russia, one in the United States, one in Canada, one in India and, the first one of all, one in New South Wales. The first we heard of them was when the Russian radio satellite began a frantic emergency message in clear, and then went dead before it finished. Then all the other space stations went dead.

Then the ship came down on Australia and, pop, up went the pale green bubble.

The bubbles were like a wall, except more flexible and beautifully controlled. The rule was: What the Sirians wanted to pass could pass; everything else could not.

Time passed; the other ships landed; there were more bubbles.

Then the bubbles grew bubbles. They clustered in groups, expanding. Sometimes the new bubbles were big, sometimes small. Sometimes a couple of months would go by without much expansion, sometimes half a dozen little buds would pop up in a week.

No metallic object could get through them at all after the first week. Evidently the Sirians had decided that was their simplest defense.

We tried non-metallic attacks, of course. We drifted poison gas and bacteria through them easily enough. But nothing happened as far as we could see . . . as far as we could see was, after all, only the outermost skin of the bubble.

A man could walk through — or most of the time he could — without feeling a thing, as long as he had taken off his wrist watch and laid down his gun. Not always. I was in Camden when the 5th Mountain Division sent in an attack with wooden spears and pottery grenades. Fifty men got through but the fifty-first bounced back, knocked unconscious, as though he'd hit a stone wall. I don't know what happened to the fifty men who got through. The only thing I'm pretty sure of is that they didn't much worry the bugs.

Some people did come back. The Sirians threw them out, like Pinky's missionary, Rocco. Probably the Sirians had chosen types who would have little of importance to tell, except how much they liked living under the Sirians. That's what they told, every one of them.

They were a problem to the Army. Most of them were soldiers, as it happened. The Army didn't much like the idea of sending them back to their units, whose morale was already hanging low, so they put the missionaries in special battalions, along with the

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goof-offs and low-grade criminals, like Pinky Postal.

Pinky heard the message of the missionaries loud and clear. He didn't like the punishment battalion at all.

He got his chance when he was handing out tetanus shots for a line of children and a jeep skidded in the slush, side-swiping the medics' personnel carrier. The kids scattered like screaming geese. By the time the medic corporal got his detail rounded up again he had only five men instead of six.

Pinky was in the back of a truck, heading south along the old Turnpike. Snow was driving down on him, but he was very happy.

He had outsmarted the Army. They would look for him, but they would look North. It is always easy to desert in the direction of the enemy in wartime; the traffic is all the other way.

He walked the last mile to the edge of the bubble, looming over him in the darkness like a green glass cliff. The snow was easing off and it was almost daylight as he stepped through.

THE Sirians never intended to destroy the Earth, only to own it. Pinky's missionary was quite right. Almost at once they began breeding slaves.

It was exactly the sort of job that Pinky would seek. He was not a bookish man, but he was immensely erudite on prurience. He knew very well what a breeding farm was like. There were the dozens of helpless, tamable does; and there was the big stud stallion, himself. What would be closer to the heart of any red-blooded boy? He made his way there, finally, very much elated. There were fifteen others in the shipment, all tall, heavy, muscular men, all extremely cheerful. They rode in the back of an old Ford pickup truck, in warm sunshine. They didn't mind that it had a purplish tinge (green, Pinky would have thought, if he had thought about it at all; but the bubble reflected the green bands of the spectrum and what came through left the sun looking like a violet spotlight in the sky.) There were lavender clouds in a mauve sky, and all around them the bugs were busy with their reconstruction. Snow-white machines on wire-mesh treads were neatly paving over the rubble that had been a small Maryland town. "Bring on the girls," bellowed Pinky, waving a bottle in one hand. It was only California sherry, but it was all he'd been able to find in the abandoned supermarket where they'd spent the night.

"Man!" cried one of the other eager breeders. "Women!" Pinky

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dropped the bottle in his excitement, staring.

They were women, all right. They were flat on their backs on a grassy meadow, their legs in the air, pumping invisible bicycle pedals under the direction of a husky blonde girl. *"Vun,* two. *T'ree,* four! *Vun,* two. *T'ree,* four! All right, ladies. Now some bending and stretching, hurry up, *yoomp!"* As the breeding stock clambered to its legs, Pinky observed that they had in fact already been bred, some months before. It was only mildly disappointing. Where these were, there were bound to be others.

The truck slowed and stopped, and Pinky saw his first Sirian.

The creature was twelve feet high but flimsily constructed. It had a green carapace like a June bug's, jointed in the center. It was not paying any attention to the snorting volunteer stallions. It stood on four hind legs, holding in its front pair of legs an instrument like a theodolite. (It had two smaller pairs of legs clasped across its olive-colored belly plate.)

"Out! Everybody out!" bawled a man in a green brassard, circling respectfully around the Sirian toward the truck. "Nip along, you!"

Pinky was first off, and first to reach the man in the green brassard. He had at that time been in the bubble for less than thirty-six hours, but he knew who to butter up. Green brassards were overseers. They were the human straw-bosses for the Sirians. "Excuse me, sir. Say. I happened to get some good cigars last night, and I wondered if you . . . ?"

THE Sirians were not hard masters, but they were firm. They knew what they wanted in the way of a slave population — strength, size, stupidity — and it was only a detail that they found it necessary to kill some of those who gave them trouble. The trouble did not have to arise from viciousness. As Pinky Postal was entrenching himself with the man in the green brassard, one of the other candidate breeders made the mistake of gawking too close to the Sirian, who moved, which startled the captive, who brushed against the horny edge of green chiton at the Sirian's tail. It was like green fire. The man did not even make a sound. Washed in a green blaze of light, he froze, straightened and fell dead.

At about that time the first dead Sirian fell into our hands — partly because of Lt. Lauchheimer and myself — and we had a chance to discover what the green fire was. Not that it helped us. It was a natural defense, like the shock of an electric eel; electromagnetic, at neural frequencies, it

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paralyzed life. Nothing else. It would not set off a match or stir a cobweb, but it would kill.

Pinky did not know this, but he knew what he had already known, that the Sirians were deadly. Shaken, he waited for the physical examination.

The overseer was not kind to Pinky because of the gift of cigars. He knew that kindness was not involved; it was a simple bribe. But as he shared Pinky's code he repaid the bribe. He did not volunteer information, but he answered questions. Would all of them be kept for breeding stock? "God, no. Six jobs want to be filled, the rest of you go back." Was there any special trick to passing the examination? The overseer jerked his thumb at a door labeled: *Dr. Lessard.* "Up to the doc." And was it really what they said, inside, all girls and fun? The overseer laughed and walked away. There had only been two cigars.

The doctor had overheard part of the conversation. He was human, a dark little man with a dark little mustache. "I give you one piece of advice," he said grimly, "stay away from Billings. What? Billings—him; the man you were talking to. He's been working for the bugs since they landed in Australia."

Pinky said, "But aren't you working for them?" The doctor did not answer, unless the extra, unnecessary twist of the blood-sampling needle was an answer. There were a lot like the doctor in the bubbles — policemen, doctors, a few elected officials of towns, who saw only one duty and that was to continue at their jobs. They worked for the bugs, but not as Billings did.

Twenty minutes later the doctor had completed his blood tests. "Do I pass?" Pinky demanded eagerly. "You know, do I get to breed?"

The doctor looked at him thoughtfully.

Abruptly he laughed. He erased a little mark on the paper and substituted another. "I think you do," he said.

Pinky didn't understand the doctor's laughter for several hours.

Then the five of the lot who had been selected were led into a long, narrow, white room with a bank of refrigerators against one wall and a remarkable quantity of test-tubes, flasks, glass tubing and other chemical-looking instruments on benches against the other. The five potent studs stared at each other, until a sour-faced human male, wearing a laboratory smock, came reluctantly in to start them on their duties.

There was a storm of questions; the man said, "Oh, shut up, all of you. I *hate* this job."

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MEANWHILE there was a war on, and we were losing it.

I don't know all the battles that were fought, I only know we didn't win them. I saw the atomic cannon on Cape Cod, I heard about the *George Washington's* attempt to penetrate the Atlantic Coast bubble, which resulted in its flooding and sinking in a hundred fathoms of water. We heard that the Russians had managed to penetrate with a plywood missile, built with a ceramic skin and guided by a human kamikaze volunteer. There was a latrine rumor that the Canadians got through with a whole squadron of gliders. But whatever results were achieved were invisible from outside the bubbles.

The one small victory that went to the human race came through Lt. Lauchheimer and myself. We buried ourselves in a little cave off a railroad tunnel, just outside Worcester, Massachusetts. We were there four weeks before the Sirians got around to expanding the bubble to include us. They finally did; and the gamble paid off.

We were inside the bubble with a live bomb.

According to Intelligence, its information derived from correlating the accounts of returned missionaries, our target was a Sirian scout vessel in the mathematical center of the sphere; blow that

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up, and the bubble would burst. We did. It did. We traveled at night and never saw a Sirian. At night the bubble was a wet-looking, faintly luminous lavender shroud. Lauchheimer had a portable electronic gizmo which triangulated the center for us. We found the center, located the ship, fused the bomb, had an hour to get away, did . . . and saw, in the first rays of the morning sun, a great mushrooming cloud that rose into a blue, bubble-free sky.

Paratroopers captured four live Sirians; eight others were found dead from the blast.

That was what gave Lauchheimer and me our Congressional Medals.

The hostages didn't stay with us very long. They were brought to Washington too, for study. Ten minutes after we got our Medals — flicker, whine — there was a sudden surge of color and a distant sound; the sun outside the White House window went purple and we were all caught.

Some months after that I found myself sharing a kennel with Pinky Postal.

III

I HAD NOT expected to see him there, though I suppose I could have guessed it. I knew more than he, though. I knew that the Sirians' idea of breeding was by no means the joyous sport that had inspired troubadors and axe-killings for thousands of years. After all, we use artificial insemination on our domestic animals, why should the Sirians be less efficient?

I knew enough, in fact, to have tried to avoid the breeding farm, for more reasons than one. Destiny makes games of our intentions; I was selected out of a thousand casual laborers in the work camp near Bethesda, and trucked to the farm overnight.

Pinky was thin, pale, trembling. He recognized me at once. "Help me, Harry! I got to get out of this place."

I looked around the place. It had been the Bethesda Naval Hospital at one time, with changes made by the bugs. It was now one enormous lying-in home, with beds for eighteen hundred women, dormitories for thousands more in the grounds around, and a special small detention home for we fortunate donors. "You got what you wanted, didn't you?" I said.

Pinky had lost forty pounds, and there was no more flesh on his arms than on a spider crab's, but he surprised me. Without a word he jumped at my throat.

I beat him off with difficulty. "All right! It was a joke."

He slumped in a heap, whining, "Oh, Harry! I been here fourteen

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months and one of the bug boys tells me I have a hundred and twenty-three kids already, and more on the way, and — And, I swear, the closest I've been to a woman is looking at them out the window. You know what? They've got some of my — They've got samples, you know, in the deep freeze. They could kill me tomorrow and I'd go right on having kids for maybe twenty years. Harry! I didn't know it would be like this at all."

I left him and looked out the window. There was an exercise yard, a mess hall, a community shower — and a wall. Donors were not allowed outside of it.

I said, "You ought to feel honored. There are only ten of these stud farms in the world."

"And they're all the same — all this artificial insemination?"

"All exactly the same, Pinky. I'm sorry." That was a lie, of course — about being sorry; why would anyone waste compassion on Pinky Postal? But I was committed to telling lies. I could not trust him with the truth.

"Maybe it will work out all right," I said vaguely, reassuring not him but myself.

It had to. *Something* had to. Of the twenty-five of us who were abruptly sworn in as intelligence officers when the bubble closed in over Washington — the last real hope of any organized effort against the bugs — I was pretty sure that I was the only survivor.

THE only hope of accomplishing anything against the Sirians lay in the possibility of destroying their central high command which was not a Sirian, or at any rate not an organic Sirian, but a machine. A computer. It did not rue them, but it detailed their plans.

There was a chance, said the general who swore us in, that if we destroyed the computer they would be confused and weakened, then we might get at them with conventional arms.

I followed Pinky's example and made friends with the man in the green brassard, Billings. I had no cigars. "I want to help you," I told him.

"My oath." He sat down with contempt and lit a cigarette with loathing. "You chaps get queerer every day."

I wheedled, "You never know, Billings. They might put you on stud any day."

"Too true." But it had shaken him. "And what can you do to stop them?"

I built a dream castle for him. "I have something they want, Billings. I can tell you about something the bugs will want to know."

Scornfully: "Hell! There isn't anything they want to know. They've a shootin' big machine

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that tells them everything they need."

"But the machine only knows what it's told. There's something the bugs have never known to tell it."

He looked impresed for a moment. "Dinkum? But —" Then he shook his head. Casually he flicked ashes on my shoe. "I know what you're up to. You fellows are always coming to me with crook stories about how this is going to help me and that's going to save my life. It's no good. You can't fool me, cobber. And if you could, I can't fool *them*."

I said persuasively, "Let me try, won't you? It's a matter of human nature."

"What is?"

"What information they've given the computer. You were caught in the first landing, weren't you? Don't you remember what happened? They took a hundred men and women and subjected them to tests; the results made up a profile of human psychology for their computer." He nodded, watching me. "But they didn't have a Pinky Postal."

BILLINGS said positively, "I don't know what the hell you're talking about."

But gradually I worked him over. I had to. Pinky was my ticket to the Sirian central headquarters. What I could accomplish there I did not know, but I knew that nothing at all could be accomplished on the stud farm. Besides, the argument was plausible — if not to Billings, then it would be to a Sirian. For what I had said was true. Their data was biased in favor of decent human beings, for their first captives were those who stood and fought. "Sure you know what you're talking about, pal?"

"I'm sure."

"You're not just sore because they wouldn't let you in with the sheilas?"

"I'm looking for a way out of here, Billings. That's all. Think it over. You'll see I'm right. They'll reward you."

He looked at me with contemptuous eyes. "You don't know much about them, do you? But probably they won't *hurt* me. Worth a try, no doubt. . . ." He said thoughtfully: "They'll be wild as cut snakes if this isn't right. And I'll be wild at you." But he finally gave in.

Pinky was pathetic in his gratitude. I was his only friend. He would never forget me; and, say, come to think of it, I was getting a break out of this too, wasn't I? How about giving him first pick of the food, for instance, or would I rather that he told the Sirians he couldn't react properly to their tests with me along?

He was reacting exactly prop-

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erly, of course. But the trouble was the Sirians had their own ideas. Billings brought us down to the big barn where the only Sirian for miles around sometimes stopped by to check performance at the stud farm and, after waiting for some hours, the Sirian appeared. Billings, trembling, tried to explain what it was I had said. The Sirian grasped the idea very quickly; my promise was kept; the Sirian took the bait. He said something into a small spherical contraption he wore dangling from one middle leg and in a moment there was a Sirian plane, and Pinky and Billings were herded into it.

Just them. Not me.

For me it was back to the stud farm. Pinky had been my ticket to the headquarters and the ticket had just been punched.

THE main Sirian headquarters on North America was in Maryland, on the site of what had once been the Bowie race track. Off to the south lay the horse barns. Where the grandstand and track itself had been, now tracelessly slagged over, stood the Sirian construction that they had flung up around their ship.

The building looked like a castle, worked like a palace. A palace is more than a home; it is workshop and office, an administrative center; so was this. But it did have a resemblance to a medieval castle, at least from a great enough distance in the air. There were things like towers and things like battlements. Closer up the resemblance was gone. The lobed wall that surrounded it was not for defense, as in a castle; it was the Sirian equivalent of a garage, where their ground and air vehicles were kept. The towers were viewless, except at the very top, where sweeping silvery needles performed a function like radar's.

Pinky and the Aussie came to it with suspicion and delight. Anything was better than the stud farm.

Or *almost* anything. But undeniably this was queer. They were sent to a hexagonal green-on-green room, small, bedless. Billings spat on the floor when he saw it. But even that satisfaction was denied him. The floor shimmered, the saliva collected in quicksilvery beads and trembled toward an almost invisible slit, where it vanished. Pinky said, "You don't like the accommodations?"

"It ain't Darling Point," said Billings. "You know what I wish? I wish that pal of yours was here. I've a notion of something I want to say to him."

But Billings had only been a strawboss at the stud farm, Pinky had actually been one of the

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studs. "It's not so bad," he said with cheerful confidence, "and anyway we'll make out. Or I will." He hesitated and said: "You won't believe this, but I wish there were some women here."

The Sirians wasted no time. Considering the limitations placed on their researches by the lack of unimpeded communication (no human ever learned the Sirian speech, and they could manage human tongues only through a sort of vodor), they were thorough and complete. None of it made much sense to Pinky, of course. All he knew was that he and Billings were bored, annoyed and persecuted for twelve hours at a time with endless nibbling nuisances. Word associations, reflex tests, interpretive depth studies much like a Rorschach — the works. "There's not much in being a guinea pig," sighed Billings, exhausted and angry.

"Would you rather be a stud?" asked Pinky, very cheerfully. He was quite happy. He had discovered an angle to shoot.

IV

THE heart of the Sirian headquarters was a room thirty feet tall, a hundred feet square, lighted with a sourceless green glow and inhabited at all times by several dozen of the bugs.

Pinky had seen the room from a gallery above it. The results of his tests and Billing's were fed into receptors in a little room just off the great one. It was there, banked like a horseshoe along three walls, that the central computer whispered and glowed.

The Sirians did not trouble with electricity in its grosser forms. The computers operated on what seemed to be neural impulses, projecting their data on soft green-ivory breast-shaped bosses in letters of light. There is very much about those computers which is mysterious, but some things are sure: For one, at least a hundred problems could be worked and answered simultaneously, so that the feat of juggling Pinky's personality quirks into the standard human profile could go on whenever convenient to the bugs, without interrupting the calculation of Hohmann trajectories for the remainder of their fleet (then approaching Orbit Pluto), the logistics of their Canadian enterprise, the setting of breeding quotas and the computation of field strengths for each bubble in their chain.

Not all of the answers were expressed numerically; some were translated directly into action in their factories; some were expressed visually. In the center of the room, for instance, was what (although Pinky could not have recognized it) was a situation

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map. The chart was of North America, but as the human convention of portraying bodies of water as featureless plains was not followed by the Sirians, Pinky could make of it nothing but a scramble of topography, as meaningless to him as the chart of the back side of the Moon.

If Pinky had had the wit to understand what he saw even he might have been shocked. The circles of Sirian bubbles were etched in fire. They had grown — *how* they had grown! All the Eastern seaboard was a string of fat Sirian beads now, and a beaded limb swung west as far as the featureless plain of Ohio. The last quick sproutings of bubbles had taken in and neutralized four Army Corps areas, eight SAC bases, the manufacturing centers of most of the eastern half of the continent and every center of population of importance north of Savannah and east of the Great Lakes. There was very little left.

Pinky Postal saw all that without comprehending. Or caring.

What he comprehended very clearly was that in the hours when he was not under scrutiny he was allowed to do as he liked.

The Sirians were not careless, they were merely confident. They had every reason to be. The few hundred humans at liberty within the headquarters had no weapons. All of them combined were no match for a single bug, who could effortlessly destroy them one after another at will. There was little prospect of effective sabotage in the areas available to the captives. Most rooms were featureless dormitories, halls, exercise areas, yards. The workshops and armories were closed to humans. The few chambers which had any strategic importance — principally the computer room — were never left untended.

Pinky restlessly prowled the headquarters and the abandoned human buildings surrounding it. He found treasures — in the old jockey's quarters, a wicker basket of champagne; in the Steward's office, a tin box full of money.

He waved the hundred-dollar bills in Billing's face, but the Aussie only snarled, "What's the use of *that?*"

"Oh, cheer up," said Pinky dispassionately. "What's the use of anything? But money's always good. You'll see."

"I'll see we'll spend the rest of our lives whingeing about here," groaned Billings. He had become very morose. He almost stopped eating and, as days passed, stopped speaking. In the tests he failed to cooperate.

Not Pinky. Pinky was a model of cooperation. He had learned that the way to get along with the bugs was to do what they wanted, and he was not surprised when

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one night as the tests were concluded Billings was detained. Pinky walked slowly toward their room, and did not even look back when from behind him he caught a flash of silent green light and heard a sharp, panicky sound from Billings, then silence. Too bad. But Pinky had his plans.

BY THEN I was in the hills around Frederick, Maryland, with the freedom forces.

Well, we called ourselves that, for morale mostly; but actually my work lay mostly in nurse-maiding chitinous young Waldo, our ace of trumps.

I had not escaped from the breeding farm, I had been liberated. A fire and noise woke us donors one night; we saw human figures dancing around the flame of burning buildings, and in the confusion the raiders broke into our close-penned corral and led us away. It was none too soon for me, and I was not only grateful, I was astonished. For these were free men and women living under the bubbles!

It was inconceivable, but there they were.

Undoubtedly the Sirians could have hunted us down, but they didn't bother. Probably there were too many humans loose under their screens, like silverfish in an old house. They had ways of locating weapons as long as there was a metallic component like the barrel of a gun or shaft of a knife — magnetic or electronic detectors, no doubt — but while we kept free of metal they never troubled us.

So our weapon was the torch.

We killed bugs, too. We fried a dozen one night in firing a stand of yellow pine where they were —I don't know; perhaps camping. We clubbed a few, killed some from a distance with bow and arrow. Strike and run, we must have destroyed fifty of them in six months. That was not a small number. It was more than one per cent of all the Sirians on Earth.

It was relatively easy for us to move about because the expanding bubbles had swept so much of the human race ahead of them. The towns were deserted. The bug centers were easy to avoid. All of North America was now under the green umbrella; a mauve sun sailed over all of Europe and most of Asia. We learned, through such sparse communications facilities as were left to us, that Africa and South America were largely bug-free. Evidently the warmer parts of the Earth were not attractive to the Sirians. They were now a sort of game preserve, nearly all that survived of humanity packed into those two continents, almost two billion people crowded into

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the malarial Amazon basin and the hot savannahs of the Congo.

So we crept about under their feet and stung them when we could. We became ingenious in setting snares. With the high-octane gasoline from an abandoned storage tank we washed one of their landing strips one night, and set it ablaze just as one of their gull-winged flyers came in. The intention was to incinerate them all, and then for us to vanish tracelessly; but the Sirian pilot saw danger at the last moment and almost soared free. The flames caught him, and the ship pinwheeled into the side of a hill. And that was very fortunate for us, because that was how we captured Waldo.

WALDO was a small, dark-green creature the size of a puppy, newly hatched and not very dangerous.

He was our first living Sirian captive. We dared take time to poke about in the wreck of the plane, knowing that there would be investigation, and we found that only two of its crew were adult Sirians; the others were eggs or hatchlings. The crash had killed them handsomely. All but one. John Gaffney found the one; rummaging through the dark he suddenly screamed: "The little louse! He bit me!" But it wasn't a bite, it was a neural shock. It was Waldo. He was alive. As he was only a newborn, his shock was painful but not deadly.

We roped him and dragged him out onto the side of the hill. In the light of a quarter million burning gallons of gasoline, pinned on his back with ten legs waving, he did not seem dangerous, only comic. "Kill him," said Gaffney, rubbing his leg.

"No." I had a better idea. "They'll never miss him. Why don't we keep him? He can be — We can use him for —"

"What?" demanded Gaffney. "No, kill him!" But I had my way finally. We had no plan for a captive Sirian, because it had never occurred to us we might catch one. But surely something would turn up!

So we swung him in a hammock and lashed him tight, and we got out of there minutes before the Sirian rescue parties were circling the sea of flame.

It was months before we had any idea of what to do with him. As I had insisted on kidnapping him, he was given me to raise. This was not pleasant. He was a painful pet, and difficult to handle.

I mention only the difficulty of feeding him. Infant Sirians were nurtured on a sort of nectar, probably once secreted by Sirian adults but now, in their dwellings, synthesized in quantity. We had

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none. We tried everything. Honey was good but hard to come by. Molasses made him drunk. Simple sugar solution he refused to touch. We finally settled on maple syrup with, after experimenting, a few drops of whiskey.

On this he thrived. I determined to try to teach him English.

I could not hope that he would ever speak it, but neither can a dog. He was much brighter than a dog. "Walk," "sit," "come" — he learned those before he was a month old. He showed that he could learn much more.

In the winter evenings he would cuddle in my lap and we would look at the pictures in magazines together, I pointing out "car" and "house" and "washing machine" and Waldo reaching out with a jointed, taloned leg to scratch at the picture on the page. He made a faint humming sound, and his hardening chiton was rather warm. I grew almost fond of him, he was so eager to learn. Yet I was kept from oversentimentality by the potent sting he carried with him always. He would fall asleep in my lap. Just as a human child will restlessly turn over a time or two before drifting off, so Waldo would emit one sleepy shock before the black, hard eyes unfocused and he went into the catalepsy that was their sleep.

As he grew larger (and he grew astonishingly fast), those light love-pats in good night became more and more agonizing. Twice I was knocked unconscious.

We tried insulation. We wrapped him in rubber sheets, shrouded him in layer on layer of quilts. We tried keeping him off my lap, merely close by on a couch. Nothing worked. Always he drowsily reached out with one leg or an eyestalk or the corner of his backplate, just before he drifted off. And I leaped half out of my skin.

ON CHRISTMAS day of the second year of the Sirian conquest, Gaffney brought us a new recruit.

I was not present when she arrived — I was out exercising Waldo, under the shelter of an overgrown old apple orchard — and I missed the questioning. By the time I got back to our camp she was asleep, worn out, but Gaffney was bubbling with news.

"She was actually in their headquarters! She drew us a plan of the whole thing, Harry—look!" It was crude, but if the girl was reliable it was all the information we had hoped for. We located the computer room, the Sirian sleeping quarters, the defensive installations, the shops, the laboratories. Slave quarters ringed one floor. Surveillance of half a continent

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was carried on in an observatory near the top. "And look here," said Gaffney in excitement, "see this line? The inner part of the headquarters is almost independent of the rest. Double walls, limited access, construction heavier, stronger inside. What does that suggest?" I opened my mouth. "A ship!" he cried, not giving me a chance, "the central part of the building is a ship!"

More than that, the girl had told him that that ship housed all the brains of the Sirian expedition. They had but one computer; it had landed with the first touchdown on Australia, but had been moved to the United States. If we could destroy that ship. . . .

"But that's the part that worries me," admitted Gaffney, downcast. "How do we get in? They let her wander about pretty much as she wanted, see — all the humans do. Fact, the humans are pretty much independent, long as they do what the bugs want. Even have their own, well, boss, a fellow who — Never mind. What I started out to say, the bugs can afford to let the humans roam around, because the corridors are booby-trapped. It's something like Waldo's shock. There are places where this girl couldn't go, because she would die, unless a Sirian was with her. It didn't bother Sirians."

We puzzled that over for a while. Waldo, beside me, rested one talon gently in my hand — he was very well behaved and quite trustworthy except, as I said, just as he was drifting off to sleep. He loomed over us (being now more than nine feet tall), staring at the scribbled map with polite curiosity.

I turned and stared at him abruptly. "Waldo! *He* could help us!" Quickly I explained. If Sirians could pass the booby-traps, why, we had our own Sirian!

I said, "We'll have to ask the girl. Did they carry anything special? But she would have said so, and I think not. I think probably their own neural shock emanations screened off the radiations from the booby traps, and if that's the case —"

"Don't guess," said Gaffney. "We've woke her up with all our noise. Here she comes now."

And there was the girl, coming drowsily into the room. She glanced toward me, stopped stark, her hand flew to her mouth, she screamed.

I threw a look at Waldo beside me.

"Oh, you saw him? Don't worry about him, young lady! He's perfectly tame. But no doubt he reminded you of the horrors you suffered while the captive of the Sirians. . . ."

She simmered down slowly, shaking her head. "No — no. I'm

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sorry to be such a fool. It isn't the *bug* I was worried about. It's just that seeing you standing there that way, so close to him — well. You scared me half to death. For a minute," she said with apologetic embarrassment, "for a minute I thought you were the boss. Mr. Postal."

V

EARTH had now been conquered in all of its important parts. We knew that the great colonizing fleet that would follow the first wave had long been orbiting the sun, reducing its velocity, knocking off miles-per-second to match speed with the Earth and to land.

What we did not know was how tedious life had become for the conquerors.

Pinky Postal, however, had them right under his eye. He saw how little there was for them to do. These were soldiers, not intellectuals, not artists, not even home-builders; their work was to fight, and they were fought out. They had won.

Two days before Billings was killed, Pinky caught a glimpse of what might be. He found five quarts of champagne and got quite drunk. In his intoxication he blundered where he knew he should not go — into Sirian quarters — and it was only the providence of drunks that kept him from a booby trap, but somehow he found himself in a small room where something heaved under a tarpaulin.

It was a queer sight, and he kicked it.

The tarpaulin flung free. There was a high-pitched Sirian chirp, and three great insect bodies bounded up from the floor, where they had been huddled. Gravely, drunkenly, Pinky realized that he was about to die. He had caught them at something, heaven knew what. And they would surely smite him low.

As he was drunk, he merely stood there, weaving slightly, breathing calm alcoholic defiance at the Sirian who bent dangerously toward him.

— But he did not die.

He did not die, and the next morning, through the pounding haze of his hangover, he wondered why. There were blanks in his recollection. But he remembered standing there, and he remembered that the killing bolt from the Sirian had never come.

He puzzled over it for a whole day.

Then, that evening, a Sirian came toward him and bent low.

Pinky was not drunk this time, and he was terrified. He tried to run, fell, squirmed and lay flat on his back while the great flat Junebug face swooped down at him.

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Again the bolt did not strike.

The face hung there, for seconds and then for minutes. And by and by Pinky saw that the Sirian was twitching. It twitched and stirred. Then it definitely staggered. It stumbled, caught itself, almost fell athwart him, caught itself again. The faint cricket-chirp sounded, ragged and . . . and . . . *drunken.*

Drunken!

And Pinky, sleepless that night, staring at the black ceiling of his green-on-green cubicle, realized that he had found what he wanted.

He became a pusher. Of himself.

OF course the Sirians had their vices. What creature does not?

Carbon dioxide was their liquor. Their respiratory systems being what they were, it was only infrequently that their own waste gases reached their intake orifices; but the concentrated breath of a mammal could send them reeling; a few minutes inhaling a man's direct breath would stiffen them in a giggling paralysis.

But on their planet of Sirius, they had no mammals.

They did what they could with what they had to work with. Their most secret vice was bundling — two (or, rarely and most despicably, three or more) of the Sirians furtively huddled under an airtight sheet, exuding CO_2 and intoxicating one another. It was a fearful vice. It was also a dangerous one. It could not be practiced openly. And when done in secret there was always the risk that the drunks would pass out and ultimately die of hyperintoxication.

They were not merely drunks, they were alcoholics, a racial characteristic; for once they had tasted the happy-gas exuded by gross mammalian chemistry they were addicts. Pinky collected his first addict by chance, but he was courageous enough and thoughtful enough to make more. It took courage. It took exposing himself to a chance bolt from a new contact, but once the first few moments were past, so was the danger. A new habit had been formed; the pusher had hooked a new customer. It was the sort of industrious empire-building to which Pinky was best fitted, for he was perceptive to all weaknesses of the flesh — even chitinous flesh hatched under alien, blue-white stars.

Pinky was supply enough for whole roomfuls of Sirians, such clouds of intoxicant wafted from him. As days and weeks passed, more and more the work of the Sirian headquarters came to revolve around him. The business of occupying Earth tended itself

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well enough. The quasi-radars kept their vigil and marked their targets, the computers never stopped monitoring the approach of the fleet and correcting its course. They gave him a vodor, so that he could talk to them direct; he talked in commands. They obeyed his commands, for he was intelligent enough to bait them. He sent them on scrounging expeditions to find choice food — a good bargain for them for, as with Earthly topers, it was not the simple chemical paralysis that pleased them best but the subtle bouquet and tang of contaminants. What bliss in the reek of green onions on his breath! What tingling thrill in the stale scent of tobacco! They sent parties rummaging through the nearby abandoned towns, for canned cheese and garlic, for spearmint chewing gum and cinnamon drops.

Food and drink supplied, he next demanded control over the other humans in the Sirian headquarters. This too they gave him — why not? It was Pinky, after all, who knew how to brew those rare blends of flavor that made all the difference. If Pinky chose to exercise the human crew in ways of his own, he never failed to share their breath with his employers. For this reason the other humans grew to hate, fear and despise him, but they feared the Sirians even more. Pinky was perfectly happy for the first time in his life. He was not a king, he was more.

The Sirians ruled the world. And, in all but name, he ruled the Sirians.

It was into this earthly paradise of Pinky's that we snakes wriggled, bringing destruction.

THE rest is history: How, emboldened by the increasing laxity of the Sirians, we attacked their headquarters; how Waldo, a happy child with no consciousness that he was betraying his race, led us through the trapped corridors into the Sirian fortress; how we were found out by that most Sirian of tyrants, Pinky Postal. For it was he who spotted us. He and his humans had ministered to the whole headquarters detachment, leaving them in a happy stupor, when the alarm bells rang, and though Pinky roused one of the bugs enough to locate us, the creature was far too tipsy to do anything about it.

It was the end of the world for Pinky Postal. His paradise was over.

He confronted us at the entrance passage, wild with fear and hate.

"Harry!" he bawled, screeching with rage. "You louse! You rat! You human!"

"Shut up," said I, and in truth

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I paid him little attention. I was wondering where the Sirians were. We didn't then know that they were all dead drunk, or almost all; we thought they might come ravening down among us with murderous shocks blazing left and right. Pinky danced before us, almost weeping; but when we deployed left and right, as we had rehearsed it so many times, he bolted away and, *crash,* a steel door slammed behind him.

We invested the outer shell of the Sirian structure with no trouble at all. It was all too easy, in fact. It turned out to be costly. Fifteen of us died in the Sirian takeoff.

Yes, the Sirian takeoff—which so many have wondered at — now the truth can be told. Two of Pinky Postal's retinue at the last, when they saw what was happening, fled with only seconds to spare back to the Earth Pinky was spurning. They told us how Pinky, raving, strove to arouse the bugs to destroy us; failing, tried to get them to lock us out; failing even in that, managed at the last only to sober one Sirian just enough to pull the master switches that blasted their ship loose from its shell, sending it screaming up, out and away, Sirians, computer, Pinky and all.

Fifteen of our raiding party died in its rocket-flames. It was a cheap price, of course.

But how are we to explain to history that the Sirian conquest of humanity was defeated not by our strength but by our vices?

AND when it comes to that, what can I say to the President?

He is very sunburned and healthy looking from his summer on the Orinoco. He is a titan at the tasks of reconstruction. Life is almost normal again; and he assures me that, with what we have learned from the works the Sirians left behind, we shall have no trouble in fighting off their invasion if they dared to attempt it again. They left a hundred bubble generators, and now we know how to pierce any bubble. We have already mopped up their survivors. Young Waldo is busy every day, trying to learn to talk to his own kind and tell them that they have lost a war.

Naturally, the President wants to reward the man who made all this possible — at, says the President with sorrow and pride, the cost of his own dear life.

I wish I could stop it, but I don't know how. I don't mind, really, that mine should not be the last Congressional Medal of Honor after all.

But I resent it most keenly that the next should go in absentia to Pinky Postal!

— **FREDERIK POHL**

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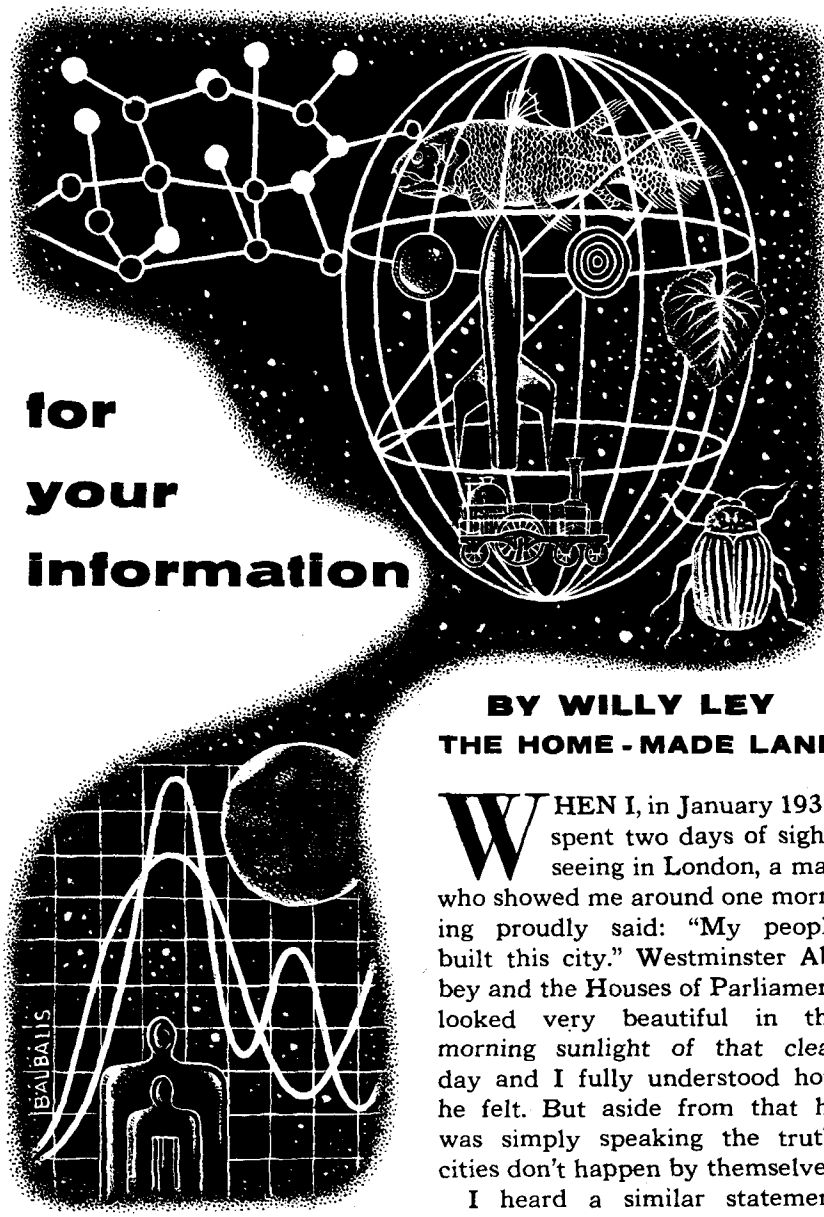

BY WILLY LEY

THE HOME-MADE LAND

WHEN I, in January 1935, spent two days of sightseeing in London, a man who showed me around one morning proudly said: "My people built this city." Westminster Abbey and the Houses of Parliament looked very beautiful in the morning sunlight of that clear day and I fully understood how he felt. But aside from that he was simply speaking the truth, cities don't happen by themselves.

I heard a similar statement

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many years later near Phoenix, Arizona, when I was shown areas made fertile by irrigation. The man said: "We made this desert into land."

But a Dutchman — and only a Dutchman — could go farther. He could point to an endless meadow, or even just to a map of his country, and declare: "We made this land!" He could even add: "And we'll make more."

The Kingdom of The Netherlands, to give it its proper name, has an area of 12,500 square miles, as any almanac will tell you. What the almanac usually does not say is that if The Netherlands were "untouched by human hands" some 6800 square miles would be under water at high tide, and would thus be uninhabitable because the salty water of the North Sea, if nothing else, would ruin all edible crops.

The Dutch have literally made half of their land themselves. Though the history of The Netherlands has its share of wars, the main enemy since 1200 A.D. has been the North Sea.

The main battleground was the area of the two provinces of North Holland and South Holland. North Holland is the area to the north of the old university town of Leiden (after which the Leiden, or Leyden, jars are named), with Amsterdam in its approximate center. The next largest Dutch city, Rotterdam, is the approximate center of South Holland.

To the south of South Holland we have the Province of Zeeland, consisting almost exclusively of islands. (The Dutch captain Abel Janszoon Tasman bestowed the name of his native province on islands about as far away from Zeeland as one can be, when staying on the same planet. This is how New Zealand got its name.) Zeeland is the current battleground, as we'll see; the battle of Holland is all but won. It merely needs consolidation.

THE watery geography of the provinces of Holland and Zeeland is determined by three rivers, all of which have their sources outside the country. The northernmost of the three is the Rhine which, as it enters Dutch territory, changes its name to Waal for a distance of about 30 miles. After that it is called by its original name, but in Dutch spelling: Rijn. (Remember Rembrandt van Rijn?) Another arm of the Rhine is called the Lek; but the portion of the Lek near its mouth is called the Nieuw Meuse. (Presumably due to an old misunderstanding, for the Meuse, or Maas, is the river to the south of the Rhine which widens into the Hollandsch Diep before it empties itself into the North Sea.) The

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third river is the Schelde, which begins to widen just as soon as it has passed Antwerp.

At one time all this was under Roman occupation, of course. It would be most interesting if some Roman had drawn us a map of the country as it looked when he was commander of a legion. Actually Roman writers say very little about the country . . . most likely because it wasn't worth anything in its natural state. Only three classical sources are known to me, Tacitus (in his *Germania*), Pomponius Mela (in his *De Chorographia*) and, of course, Cajus Plinius Secundus (Pliny the Elder) in his "Natural History". Pomponius Mela has just one sentence for the current Holland: "Then it (meaning the Rhine) is no longer a river but an enormous lake covering a large area, called Flevo." (. . ."*sed ingens lacus, ubi campos implevit, Flevo dicitur,*" if you want the original wording.)

The most accurate, as usual, is Pliny. He states that the Rhine in that area has three arms, named Helium (the westernmost), Rhenus (the center arm) and Flevum (the arm that goes to the north.) "In the north the Rhine widens into the lake. In the west it empties into the Meuse." One of the commentators of Pliny added that in 12 B.C. the Roman general Drusus Germanicus (also known as Drusus Senior) "connected Flevo lake with the Rhine, probably following the bed of the river Yssel" (in Dutch IJssel.)

All this is not too helpful now, but a few facts emerge.

River water made a very large lake, probably in the southern part of what later became the Zuider Zee, while at least one arm of the Rhine seems to have merged inland with the Meuse. The overall picture is that of an area where a canoe was far more useful than a horse — and which, consequently, did not interest the Romans. They liked firm ground and were partial to paved highways.

Since two Dutch words will crop up all the time in what is to follow they might as well be explained in advance. The word *Zee* (pronounced *Zay*) refers to a body of salt water, while the word *Meer* (pronounced like "mare") means a body of fresh water. This is somewhat confusing, because two German words which look almost the same and sound the same happen to have almost the opposite meanings. A German *See* is a fresh-water lake, if used with the masculine article, and a body of salt water if used with the feminine article. And the German word *Meer* means the ocean. One sometimes feels that a good synonym for "language" would be "chaos."

At any event, the Dutch

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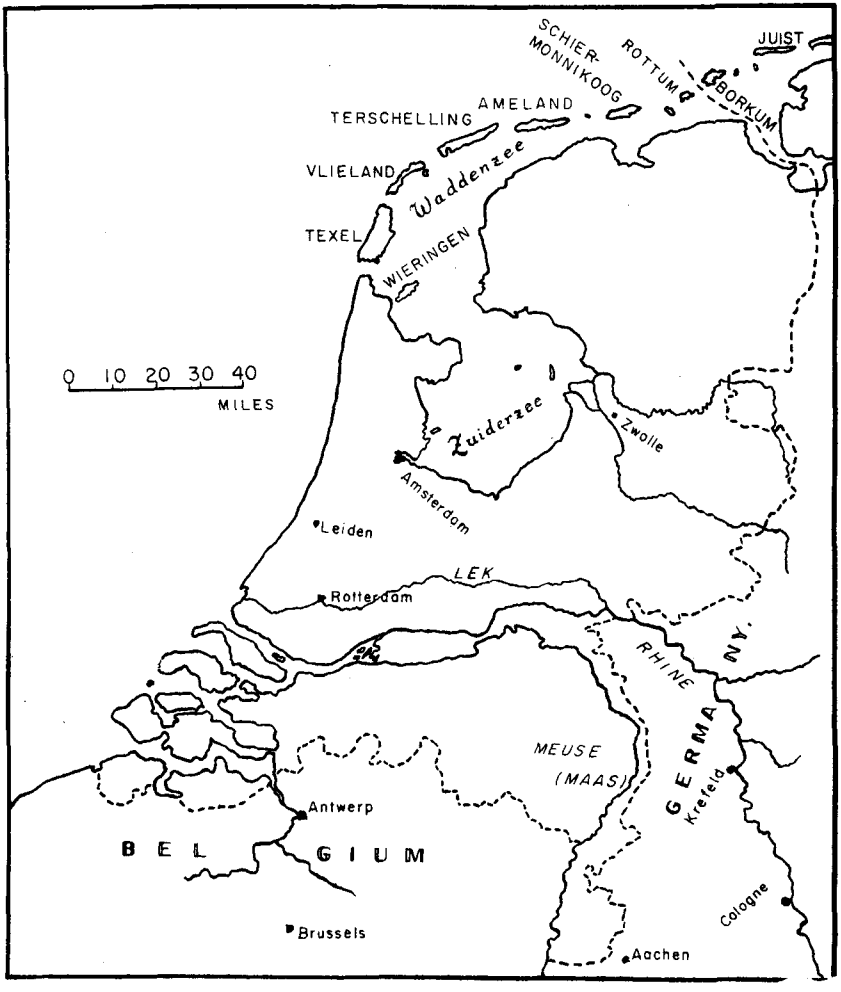

The Kingdom of The Netherlands prior to the Zuider Zee plan.

wrested land both from the salty *Zee* and from freshwater *Meer* by building dikes, filling in and draining. But, in spite of hard work through many generations, the overall balance did not look so good. A Dutch government pamphlet states that between 1200

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and about 1900 A. D. the Dutch made land to the following extent:

940,000 acres along the seashore
345,000 acres by draining lakes

1,285,000 acres.

But during the same time they lost 1,400,000 acres!

The name of that loss was Zuider Zee.

THE formation of the Zuider Zee is easy to explain. The whole area was below sea level all along, with its deepest portion filled by Flevo lake. But a great deal of the Zuider Zee area remained dry land simply because higher land near the shore protected it from the North Sea.

The catastrophe which flooded the low-lying basin with salt water announced itself with a stormy spring tide on All Saint's Day of 1170 A. D. On that day the North Sea tore two pieces of land from the North Holland province, creating the two islands of Wieringen and Texel. Just about a century later, on Christmas Day, 1277, the North Sea finally broke through, flooding the whole area and producing the Zuider Zee.

In 1277 nobody could even think of doing anything about it.

But a few centuries later, presumably encouraged by successful dike building on a smaller scale, some Dutchman began to wonder whether the work of the North Sea might not be undone. A study by Hendrik Stevin, published in 1667 under the title "How the Fury of the North Sea may be stopped and Holland may be protected against it" may not have been the very first study to consider draining of the Zuider Zee, but it was the first to see print. During the following 150 years the idea of reclaiming the area covered by the Zuider Zee was expounded quite often in the Netherlands (some Germans also gave good advice across the border) but it got to be a theme like the railway tunnel from Calais to Dover: much literature and no action.

The reason why there was no action was very simple: any Zuider Zee plan would require a colossal investment.

If the plan succeeded this investment would be recovered and, in time, large profits would be made. But if it failed for any one of a dozen different reasons the investment would be a total loss.

In the meantime another project simply had to be tackled. There were two bodies of fresh water which offered a threat to Amsterdam, the capital. One of them was the *IJ* (the Dutch treat "ij" as *one* letter, hence the apparent double capital in words like IJssel; the pronunciation is sim-

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ply a long *I*) which had an open connection to the Zuider Zee. The other was the *Haarlemmermeer.*

To get rid of the menace, the sum of 8,355,000 guilders was earmarked in 1837. Work began three years later and lasted a dozen years. The Dutch government somewhat ruefully stated that it had cost 13,789,377 guilders. But it had been a success, even though another 20 years of work were needed to change the newly won land into fruitful soil.

The Dutch name for reclaimed land is "polder". Reclaiming land is therefore called by a term which can be Anglicized as "inpoldering." While the IJ polder and the Haarlemmermeer polder were still wet, three scientists and engineers, van Diggelen, Kloppenburg and Faddegon, published a similar scheme for the Zuider Zee. An enormous dike was to close the mouth of the big bay, the trapped water was slowly to be pumped out and the two rivers emptying themselves into the Zuider Zee, the IJssel and the Amstel, were to be diverted to go into the North Sea directly.

The cost estimate was 92 million guilders.

AS MORE and more projects were published or submitted to the government in the form of memoranda, the government felt that there should be a body of experts which could judge the feasibility of the various plans. Thus an evaluation group, the *Zuiderzeevereeniging,* was established.

To see what they would get if they did inpolder the Zuider Zee extensive drilling was carried out. (One source says 2188 test drillings were made.) It became clear that about three-fourths of the area of the Zuider Zee could be made into valuable land.

Especially three men were the driving spirits: van Diggelen, Dr. Cornelis Lely and the head of the evaluation group, Dr. Buma. A complete plan was finished in 1892. But it took time. The turning point was probably the speech made by Queen Wilhelmina of The Netherlands on the occasion of the opening of parliament in September, 1913. The speech contained the sentences: "I consider the time has come to undertake the enclosure and reclamation of the Zuider Zee. The result will be improved water control conditions in the adjacent provinces, extension of territory and a permanent increase in the opportunities of employment."

If times had been normal, the Queen's words would probably have caused quick action. But times were not normal. The First World War was brewing.

The act of parliament which decided to attack the Zuider Zee

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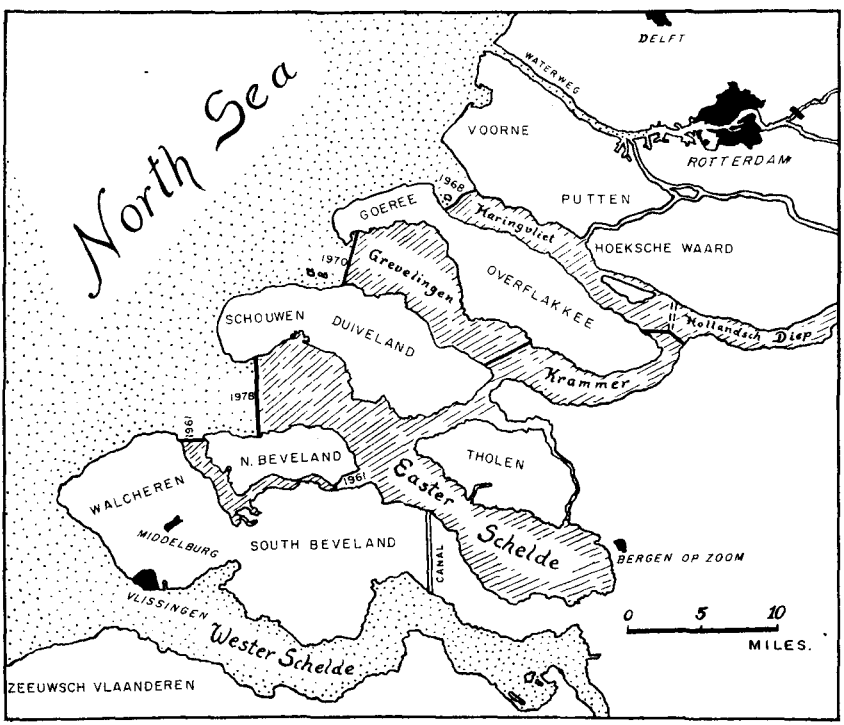
was passed on June 14, 1918. The scheme to be followed was that of Dr. Cornelis Lely.

It differed from other and earlier schemes in preserving a body of water in the Zuider Zee area. The older schemes had simply wanted to close up the whole of the bay and to re-route the rivers going into the Zuider Zee so that they would go into the North Sea directly. Dr. Lely pointed out that this might lead to floods farther inland if, as can happen, a storm-driven flood raises the level of the North Sea for a few days above the level of the rivers. This does not mean, of course, that the level of the whole North Sea would be above that of the rivers; it would only be the level of the sea near the coast. But that is reason for disaster enough. Moreover, Dr. Lely did not want to kill off the Zuider Zee fisheries. Finally, he wanted the



The Delta Plan for the protection of the islands of Zeeland.

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newly won land to be accessible by water.

In short: instead of just drying up the whole bottom of the bay, a number of very large islands were to be created in its area.

The overall scheme, then, envisaged first the construction of the main dike, from the island of Wieringen to Friesland at the eastern shore of the Zuider Zee. Then two large polders were to be started, one going south from the island of Wieringen, 49,000 acres in extent. This was first called the northwest polder, but later the name was changed to Wieringermeer polder.

The other polder was to be to the South of Friesland, the northeast polder, 119,000 acres in extent. It is, incidentally, the only one which has retained its original and purely geographical name. Then the southeast polder, the biggest of them all (232,000 acres) was to be tackled. Since then the name has ben changed into Flevoland, since this is the probable area of *Flevo Lacus* of the Romans. Also, the job has been subdivided into two phases, East Flevoland and South Flevoland, though this is going to be one polder when finished.

The last of the projected polders was the southwest polder (150,000 acres), now called Markerwaard.

The remaining body of water would then have an area of nearly 250,000 acres. It had to be fairly large to receive the waters of the IJssel and other smaller rivers, and because of the peculiar and probably unique circumstance that the salt water outside the main dike would often have a higher level than the water inside the dike. No water could then be discharged into the North Sea. And under bad flood conditions this might go on for some time, so there had to be a basin to hold the river water until it could be discharged.

But in the course of time this basin would become fresh water, hence it should no longer be called by the old name: No longer Zuiderzee (the Dutch run words together) but IJsselmeer.

WORK started in 1927. Three things were tackled simultaneously, the main dike, the Wieringermeer polder and a 100-acre trial polder which was named Andijk. The purpose of the trial polder was to have an experimental area for finding out how the land had to be treated after it had been inpoldered.

Obviously you can't go ahead and try to sow wheat or plant beets on land which had been soaking in salt water for six hundred years. Incidentally, the polders to be started later would benefit from the gradual sweet-

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ening of the IJsselmeer, since that would leach out salt.

By 1929 the test polder was dry. The next task was to make it into soil which could be useful.

At the German end of the North Sea land had been reclaimed from the sea in the past, too, by inpoldering. There it had been a rule of thumb among the peasants that a new polder, if kept well drained, would become useful in six or seven years time. In half a dozen years enough rain fell on a polder to wash the salt away. The Dutch presumably had done the same in the past, but now they were looking for methods to speed up the natural process. Gypsum was added to the soil, then fertilizers, different fertilizers in different parts of the test polder. Then they experimented with various vegetables to see which would succeed.

The test polder ceased to exist as such on November 1, 1935. It had done its job as an experimental farm. Now it became just a farm.

By that time the main dam was finished, too.

The island of Wieringen served as an anchor. It had been connected to the mainland with a comparatively short dam in 1925. The big job was the dam from Wieringen to Friesland, 20 miles of dam to be built right through the sea. The bulk of the dam is sand and earth dredged from the sea bottom.

On the inland side the dam has a heavy stone facing. On the seaward side there is a bulge of boulder clay. On top of this clay bulge brushwood mattresses were laid, made by twisting brushwood into heavy rope-like shapes and then weaving these "ropes" into mattresses. On top of the mattresses they dumped heavy boulders, field stones, pieces of old concrete, anything that would weigh a lot and withstand the pounding of the waves for an indefinite length of time.

At first this was just hard work, in the sense that large quantities of clay and rocks had to be moved and put into position. But as the building of the dam progressed, the space through which the tide could flow in and out of the Zuider Zee became narrower and narrower and the current in the remaining gap became more and more violent.

The man who furnished the necessary calculations of what to expect of this current was Hendrik Antoon Lorentz, Nobel Prize winner in Physics in 1902. As the critical period of closing the final gap approached, the expenditure in men and equipment began to resemble that for a real battle. Ten thousand people were on the dam. There were 27 large dredges in action, 13 floating cranes, 132

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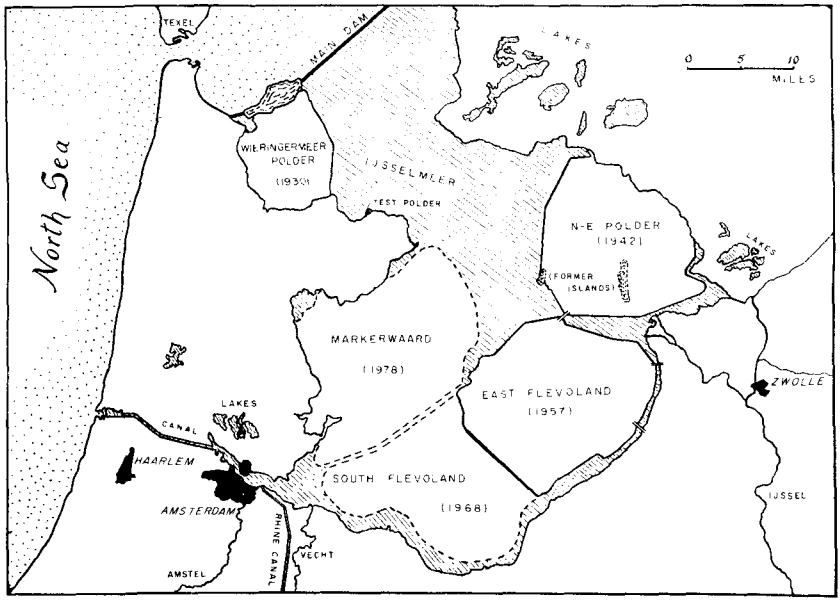

The Polders in the former Zuider Zee.

barges and 88 tugs. The closing of the dam was timed like an attack. At such and such a time the current would be near a standstill, then were so and so many hours for plugging the dam. When the tide returned it had to find a solid obstacle.

The dam was finished on May 28, 1932.

AT THAT time the polder to the south of the island of Wieringer, the Wieringermeer polder, was ready to receive its first crop. Since the area was somewhat protected by the island (and by the beginnings of the big dam), this polder had been finished in 1932. The experience gained on the test polder enabled the Dutch experts to make the land arable within only two years of its being dry.

On this polder — as well as on the ones finished later — the system was to divide it into plots of roughly 50 acres. Each one of these plots had a paved road in front and a large canal in the back, making it accessible both by land and by water. Just in case the main dam might give way, a most unlikely thing, a *terp* (arti-

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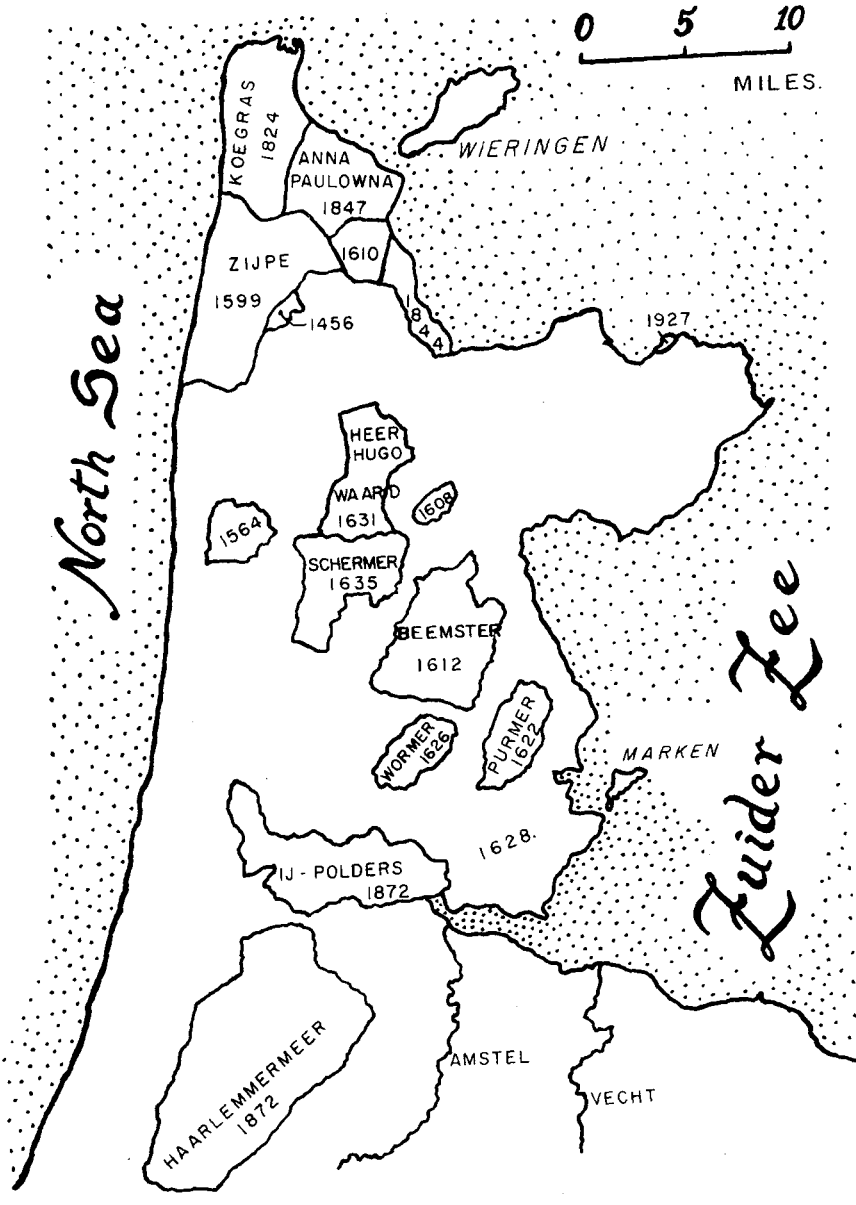

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ficial hill) was built in the center of the polder. It is high enough to be several feet above the highest recorded flood level of the North Sea, and large enough to protect everything on the polder than can move and climb it. (Somebody calculated that the whole population of Amsterdam would have standing room on top of the terp.)

Two years after finishing the big dam work began on northeast polder, which was ready to bear crops ten years later, in 1942.

Naturally the soil of such a polder is not uniform. As anywhere else the quality varies from area to area. The best land of a polder is used for vegetables, the next best for grain (mainly rye), while the poorest sections are forested.

The largest of the polders, formerly the southeast polder, now Flevoland, has been divided into two phases. East Flevoland was ready in 1957, South Flevoland is expected to be ready in 1968. The Markerwaard polder is expected to be ready in 1978.

When the Dutch started on this enormous project in 1927 they probably expected, or at least hoped, that they could reclaim their Zuider Zee area in about half a century without having to worry about many other things. But two major catastrophes happened.

The first was the German occupation of the Netherlands during the Second World War which, naturally, brought everything to a near standstill, though the Germans, at first, did not interfere directly. In fact quite a number of German engineers looked very carefully, if unofficially, at the Wieringermeer polder, because they had had a similar project in mind since about 1932. There had been talk about inpoldering a bay called the Frische Haff (to the east of Danzig) and they wanted to see how it was done.

The Frische Haff project would have been easier than the Zuider Zee for several reasons. To begin with, the bay is nearly fresh water naturally, and because of the geometry of the land only an eight-mile dam would be needed. This project, incidentally, is now dead because the area became Polish after the war. Of course it may be revived as a Polish project.

But near the end of the war the Germans wrecked dikes deliberately to protect their own retreat, especially in the area of the Province of Zeeland. But the dikes wrecked by the retreating Ger-

How the Dutch made North Holland.

The polders prior to the attack on the Zuider Zee.

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man armies were repaired and Zeeland lived up to its Latin motto *luctor et emergo*, "I struggle and emerge."

AFTER the damage had been repaired most Dutchmen, including the Zeelanders, would concede that such things could and would happen during a war, but thought that everything was fine with the dikes and the coexistence of the North Sea and the Kingdom of The Netherlands otherwise. The day and night which taught them differently was the first day of February, 1953.

Storm conditions were unusual and intense, the dikes of Zeeland were breached in 67 places, 375,000 acres of land were flooded, 9,000 buildings destroyed and 38,000 more damaged. The death toll was 1800 people.

The overall damage was estimated at over 300 million dollars.

A Dutch agency, the *Rijkswaterstaat* (we would call an equivalent agency, if we had one, the Federal Water Administration), had been worried all along, and had drafted memoranda about things that really should be done. But their warnings had appeared unnecessary.

But after the February flood of 1953 every Dutchman suddenly realized what he had merely learned in school, namely that 60 per cent of the kingdom's population live and work below sea level. And the *Rijkswaterstaat's* plan was quickly accepted.

Zeeland, as a look at the map will show, consists of half a dozen large and a few small islands, grouped around four major outlets for river water into the sea. But under bad storm conditions these become four major inlets for the sea.

To keep the islands of Zeeland safe as they now are, some 500 miles of dikes would have to be raised by six to seven feet, involving the reconstruction of about a hundred locks, culverts, pumping stations and so forth. The alternative, the Delta Plan, is just to tie the whole complex of islands together into one land by building a total of about 20 miles of dikes, as sturdy as the main dam, across the mouth of the Zuider Zee.

The first step of the Delta Plan — now under way — is the so-called three-island plan, a name which is based on the fact that once Walcheren, North Beveland and South Beveland were three islands.

Earlier work has already connected Walcheren and South Beveland. Then the northernmost of those outlets, called Haringsvliet, is to be dammed. The target date is 1968. Then the second outlet, called the Brouwer-

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shavensche Gat, is to be dammed; this dam should be completed in 1970. The next dam, and incidentally the longest one in the Delta Plan, will go across the outlet called the Easter Schelde. (It is called that not with the religious holiday in mind but in contrast to the Wester Schelde.) It will seal it off by 1978.

The southernmost of the outlets, the Wester Schelde, must be left open; there is heavy traffic up and down the Wester Schelde to Antwerp, which is not a Dutch city. Here the dike along the southern shore of Walcheren and South Beveland will have to be raised and strengthened. The same is true to the north of Zeeland. The deep channel between Rotterdam and the sea, the so-called Rotterdamsche Waterweg, also cannot be interfered with, so that a protecting dike at or near the southern shore of the Waterweg is indicated.

One of the reasons why the Delta Plan was accepted so fast and is pursued energetically is that the storm conditions of 1953 have been carefully examined. It turned out, to everybody's horror, that the 1953 situation still contained mitigating factors. The flood could have been four feet higher than it was!

The Delta Plan is mainly defensive. It is not aimed at producing much new land. But it has the secondary aim of producing a large fresh water reservoir. The interconnected bodies of water behind the Delta Plan dams are already referred to collectively as the *Zeeuwse Meer*, the Zeeland lake.

The fact is that The Netherlands, which are always plagued by too much sea water and are seasonally plagued by too much river water too, do need more fresh water in midsummer. The *Zeeuwse Meer* will be the irrigation reservoir for these periods.

THERE are two secondary dams, from Duiveland to Overflakkee and from there to the mainland. Later on they will carry highways, but their primary purpose is to influence the currents in such a way that the main dams will be easier to build.

Another part of the Delta Plan is a most interesting construction to the east of Rotterdam. There is a river coming in from the east called the *Hollandsche IJssel*. Though the name is the same it has nothing to do with the IJssel which puts fresh water into the IJsselmeer. (The latter is sometimes called the Geldersche IJssel, to avoid confusion between the two rivers.) What is wrong with the Hollandsche IJssel is that it could be a very vulnerable point in case of a bad flood. The sea, racing up in a tidal wave through

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Cross section through the big dam across the mouth of the (former) Zuider Zee.

the Rotterdamsche Waterweg could enter the Hollandsche IJssel and pour into the low-lying land to the East of Rotterdam.

What has been built is actually an enormous guillotine, a steel blade as wide as the river, resting in two massive towers. If a wave should come up the Waterweg the steel blade can be lowered within minutes, literally cutting off the flood. The construction is now being finished, but as far as I know it hasn't been needed yet.

As has been mentioned, the purpose of the Delta Plan is not to make more land, but to make the existing land safe. However, between 25,000 and 40,000 acres of new land will be a by-product.

Have the Dutch reached the limit of the new land they can make with the Delta Plan?

By no means. There is another scheme in the future. Dutch government sources are careful to point out that this is in the more distant future — partly, no doubt, to calm the feelings of Dutch tax payers, partly because the Delta Plan should be hurried with all available means, since nobody can tell when the next big flood will build up.

But that "future plan" is obvious from a glance at the map. There is rather shallow water to the north of the big Zuider Zee dam. The Dutch call it the Waddenzee. To the north of the Waddenzee you have a chain of islands, obviously indicating the original coastline. A dam from North Holland to the island of Texel would not be longer than the average Delta Plan dam, though it may be more difficult to build.

The same statement holds true for the dams between the islands all the way to the island of Ameland, and a dam from Ameland to the mainland would be only about half the length of the Zuider Zee dam.

One Dutch expert, Prof. Thyse, said, "It will be done not later than the year 2000."

Personally I am willing to bet that it will be long finished when that oft-used date comes around.

— WILLY LEY

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By FRANK HERBERT
Illustrated by DICK FRANCIS

Mating Call

It's a new thrill, no doubt. But do you think it'll ever replace old-fashioned sex?

"IF you get caught we'll have to throw you to the wolves," said Dr. Fladdis. "You understand, of course."

Laoconia Wilkinson, senior field agent of the Social Anthropological Service, nodded her narrow head. "Of course," she barked. She rustled the travel and order papers in her lap.

"It was very difficult to get High Council approval for this expedition after the . . . ah . . . unfortunate incident on Monligol," said Dr. Fladdis. "That's why your operating restrictions are so severe."

"I'm permitted to take only this — " she glanced at her papers — "Marie Medill?"

"Well, the basic plan of action was her idea," said Dr. Fladdis. "And we have no one else in the

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department with her qualifications in music."

"I'm not sure I approve of her plan," muttered Laoconia.

"Ah," said Dr. Fladdis, "but it goes right to the heart of the situation on Rukuchp, and the beauty of it is that it breaks no law. That's a legal quibble, I agree. But what I mean is you'll be within the letter of the law."

"And outside its intent," muttered Laoconia. "Not that I agree with the law. Still — " she shrugged — "music!"

Dr. Fladdis chose to misunderstand. "Miss Medill has her doctorate in music, yes," he said. "A highly educated young woman."

"If it weren't for the fact that this may be our last opportunity to discover how those creatures reproduce — " said Laoconia. She shook her head. "What we really should be doing is going in there with a full staff, capturing representative specimens, putting them through — "

"You will note the prohibition in Section D of the High Council's mandate," said Dr. Fladdis. "*'The Field Agent may not enclose, restrain or otherwise restrict the freedom of any Rukuchp native.'*"

"How bad is their birthrate situation?" asked Laoconia.

"We have only the word of the Rukuchp special spokesman. This Gafka. He said it was critical. That, of course, was the determining factor with the High Council. Rukuchp appealed to *us* for help."

Laoconia got to her feet. "You know what I think of this music idea. But if that's the way we're going to attack it, why don't we just break the law all the way — take in musical recordings, players . . ."

"Please!" snapped Dr. Fladdis.

Laoconia stared at him. She had never before seen the Area Director so agitated.

"The Rukuchp natives say that introduction of *foreign* music has disrupted some valence of their reproductive cycle," said Dr. Fladdis. "At least, that's how we've translated their explanation. This is the reason for the law prohibiting any traffic in music devices."

"I'm not a child!" snapped Laoconia. "You don't have to explain *all*. . ."

"We cannot be too careful," said Dr. Fladdis. "With the memory of Monligol still fresh in all minds." He shuddered. "We must return to the spirit of the SocAnth motto: *'For the Greater Good of the Universe.'* We've been warned."

"I don't see how music can be anything but a secondary stimulant," said Laoconia. "However, I shall keep an open mind."

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LAOCONIA Wilkinson looked up from her notes, said: "Marie, was that a noise outside?" She pushed a strand of gray hair from her forehead.

Marie Medill stood at the opposite side of the field hut, staring out one of the two windows. "I only hear the leaves," she said. "They're awfully loud in that wind."

"You're sure it wasn't Gafka?"

Marie sighed and said, "No, it wasn't his namesong."

"Stop calling that monster a him!" snapped Laoconia.

Marie's shoulders stiffened.

Laoconia observed the reflex and thought how wise the Service had been to put a mature, veteran anthropologist in command here. A hex-dome hut was too small to confine brittle tempers. And the two women had been confined here for 25 weeks already. Laoconia stared at her companion—such a young romantic, that one.

Marie's pose reflected boredom . . . worry . . .

Laoconia glanced around the hut's crowded interior. Servo-recorders, night cameras, field computers, mealmech, collapsible floaters, a desk, two chairs, folding bunks, three wall sections taken up by the transceiver linking them with the mother ship circling in satellite orbit overhead. Everything in its place and a place for everything.

"Somehow, I just can't help calling Gafka a him," said Marie. She shrugged. "I know it's nonsense. Still . . . when Gafka sings. . ."

Laoconia studied the younger woman. A blonde girl in a one-piece green uniform; heavy peasant figure, good strong legs, an oval face with high forehead and dreaming blue eyes.

"Speaking of singing," said Laoconia, "I don't know what I shall do if Gafka doesn't bring permission for us to attend their Big Sing. We can't solve this mess without the facts."

"No doubt," said Marie. She spoke snappishly, trying to keep her attention away from Laoconia. The older woman just sat there. She was always just sitting there — so efficient, so driving, a tall gawk with windburned face, nose too big, mouth too big, chin too big, eyes too small.

MARIE turned away.

"With every day that passes I'm more convinced that this music thing is a blind alley," said Laoconia. "The Rukuchp birthrate keeps going down no matter how much of our music you teach them."

"But Gafka agrees," protested Marie. "Everything points to it. Our discovery of this planet brought the Rukuchps into contact with the first alien music

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they've ever known. Somehow, that's disrupted their breeding cycle. I'm sure of it."

"Breeding cycle," sniffed Laoconia. "For all we know, these creatures could be ambulatory vegetables without even the most rudimentary. . ."

"I'm so worried," said Marie. "It's music at the root of the problem, I'm sure, but if it ever got out that we smuggled in those education tapes and taught Gafka all our musical forms. . ."

"We did *not* smuggle anything!" barked Laoconia. "The law is quite clear. It only prohibits any form of *mechanical* reproducer of actual musical sounds. Our tapes are all completely visual."

"I keep thinking of Monligol," said Marie. "I couldn't live with the knowledge that I'd contributed to the extinction of a sentient species. Even indirectly. If our *foreign* music really has disrupted . . ."

"We don't even know if they breed!"

"But Gafka says. . ."

"Gafka says! A dumb vegetable. Gafka says!"

"Not so dumb," countered Marie. "He learned to speak our language in less than three weeks, but *we* have only the barest rudiments of songspeech."

"Gafka's an idiot-savant," said Laoconia. "And I'm not certain I'd call what that creature does *speaking.*"

"It is too bad that you're tone deaf," said Marie sweetly.

Laoconia frowned. She leveled a finger at Marie. "The thing I note is that we only have their word that their birthrate is declining. They called on us for help, and now they obstruct every attempt at field observation."

"They're so shy," said Marie.

"They're going to be shy one SocAnth field expedition if they don't invite us to that Big Sing," said Laoconia. "Oh! If the Council had only authorized a *full* field expedition with armed support!"

"They couldn't!" protested Marie. "After Monligol, practically every sentient race in the universe is looking on Rukuchp as a final test case. If we mess up another race with our meddling . . ."

"Meddling!" barked Laoconia. "Young woman, the Social Anthropological Service is a holy calling! Erasing ignorance, helping the backward races!"

"And we're the only judges of what's backward," said Marie. "How convenient. Now, you take Monligol. Everyone knows that insects carry disease. So we move in with our insecticides and kill off the symbiotic partner essential to Monligolian reproduction. How uplifting."

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"They should have told us," said Laoconia.

"They couldn't," said Marie. "It was a social taboo."

"Well. . ." Laoconia shrugged. "That doesn't apply here."

"How do you know?"

"I've had enough of this silly argument," barked Laoconia. "See if Gafka's coming. He's overdue."

MARIE inhaled a trembling breath, stamped across to the field hut's lone door and banged it open. Immediately the tinkle of glazeforest leaves grew louder. The wind brought an odor of peppermint from the stubble plain to her left.

She looked across the plain at the orange ball of Almac sinking toward a flat horizon, swung her glance to the right where the wall of the glazeforest loomed overhead. Rainbow-streaked batwing leaves clashed in the wind, shifting in subtle competition for the last of the day's orange light.

"Do you see *it?*" demanded Laoconia.

Marie dropped her attention to the foot of the forest wall, where stubble spikes crowded against great glasswood trunks. "No."

"What *is* keeping that creature?"

Marie shook her head, setting blonde curls dancing across her uniform collar. "It'll be dark soon," she said. "He said he'd return before it got fully dark."

Laoconia scowled, pushed aside her notes. *Always calling it a him! They're nothing but animated Easter eggs! If only . . .* She broke the train of thought, attention caught by a distant sound.

"There!" Marie peered down the length of glazeforest wall.

A fluting passage of melody hung on the air. It was the meister-song of a delicate wind instrument. As they listened, the tones deepened to an organ throb while a section of cello strings held the melody. Glazeforest leaves began to tinkle in sympathetic harmony. Slowly, the music faded.

"It's Gafka," whispered Marie. She cleared her throat, spoke louder, self-consciously: "He's coming out of the forest quite a ways down."

"I can't tell one from the other," said Laoconia. "They all look alike and sound alike. Monsters."

"They do look alike," agreed Marie, "but the sound is quite individual."

"Let's not harp on my tone deafness!" snapped Laoconia. She joined Marie at the door. "If they'll only let us attend their Sing. . ."

A six-foot Easter egg ambled toward them on four of its five prehensile feet.

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The crystal glistening of its vision cap, tipped slightly toward the field hut, was semi-lidded by inner cloud-pigment in the direction of the setting sun. Blue and white greeting colors edged a great bellows muscle around the torso. The bell extension of a mouth/ear—normally visible in a red-yellow body beneath the vision cap — had been retracted to a multi-creased pucker.

"What ugly brutes," said Laoconia.

"Shhhh!" said Marie. "You don't know how far away he can hear you." She waved an arm. "Gaaafkaa!" Then: "Damn!"

"What's wrong?"

"I only made eight notes out of his name instead of nine."

Gafka came up to the door, picking a way through the stubble spikes. The orange mouth/ear extended, sang a 22-note harmonica passage: "Maarrriee Mmmmmmedillll." Then a 10-second concerto: "Laoconnnnia Wiiilkinnnsonnnn!"

"How lovely!" said Marie.

"I wish you'd talk straight out the way we taught you," said Laoconia. "That singing is difficult to follow."

GAFKA'S vision cap tipped toward her. The voice shifted to a sing-song waver: "But polite sing greeting."

"Of course," said Laoconia. "Now." She took a deep breath. "Do we have permission to attend your Big Sing?"

Gafka's vision cap tipped toward Marie, back to Laoconia.

"Please, Gafka?" said Marie.

"Difficulty," wavered Gafka. "Not know how say. Not have knowledge your kind people. Is subject not want for talking."

"I see," said Laoconia, recognizing the metaphorical formula. "It has to do with your breeding habits."

Gafka's vision cap clouded over with milky pigment, a sign the two women had come to recognize as embarrassment.

"Now, Gafka," said Laoconia. "None of that. We've explained about science and professional ethics, the desire to be of real help to one another. You must understand that both Marie and I are here for the good of your people."

A crystal moon unclouded in the part of the vision cap facing Laoconia.

"If we could only get them to speak straight out," said Laoconia.

Marie said: "Please, Gafka. We only want to help."

"Understand I," said Gafka. "How else talk this I?" More of the vision cap unclouded. "But must ask question. Friends perhaps not like."

"We are scientists," said Lao-

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conia. "You may ask any question you wish."

"You are too old for . . . breeding?" asked Gafka. Again the vision cap clouded over, sparing Gafka the sight of Laoconia shocked speechless.

Marie stepped into the breech. "Gafka! Your people and my people are . . . well, we're just too different. We couldn't. There's no way . . . that is . . ."

"Impossible!" barked Laoconia. "Are you implying that we might be sexually attacked if we attended your Big Sing?"

Gafka's vision cap unclouded, tipped toward Laoconia. Purple color bands ran up and down the bellows muscle, a sign of confusion.

"Not understand I about sex thing," said Gafka. "My people never hurt other creature." The purple bands slowed their upward-downward chasing, relaxed into an indecisive green. The vision cap tipped toward Marie. "Is true all life kinds start egg young same?" This time the clouding of the vision cap was only a momentary glimmerwhite.

"Essentially, that is so," agreed Laoconia. "We all *do* start with an egg. However, the fertilization process is different with different peoples." Aside to Marie, she said: "Make a note of that point about eggs. It bears out that they may be oviparian as I suspected." Then: "Now, I must know what you meant by your question."

Gafka's vision cap rocked left, right, settled on a point between the two women. The sing-song voice intoned: "Not understand I about different ways. But know I you see many thing my people not see. If breeding (glimmerwhite) different, or you too old for breeding (glimmerwhite) my people say you come Big Sing. Not want we make embarrass for you."

"WE are scientists," said Laoconia. "It's quite all right. Now, may we bring our cameras and recording equipment?"

"Bring you much of things?" asked Gafka.

"We'll only be taking one large floater to carry our equipment," said Laoconia. "How long must we be prepared to stay?"

"One night," said Gafka. "I bring worker friends to help with floater. Go I now. Soon be dark. Come moonrise I return, take to Big Sing place you." The trumpet mouth fluted three minor notes of farewell, pulled back to an orange pucker. Gafka turned, glided into the forest. Soon he had vanished among reflections of glasswood boles.

"A break at last!" barked Laoconia. She strode into the hut, speaking over her shoulder. "Call

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the ship. Have them monitor our equipment. Tell them to get duplicate recordings. While we're starting to analyze the sound-sight record down here they can be transmitting a copy to the master computers at Kampichi. We want as many minds on this as possible. We may never get another chance like this one!"

Marie said: "I don't — "

"Snap to it!" barked Laoconia.

"Shall I talk to Dr. Baxter?" asked Marie.

"Talk to Helen?" demanded Laoconia. "Why would you want to bother Helen with a routine question like this?"

"I just want to discuss. . ."

"That transceiver is for official use only," said Laoconia. "Transmit the message as I've directed. We're here to solve the Rukuchp breeding problem, not to chit-chat."

"I feel suddenly so uneasy," said Marie. "There's something about this situation that worries me."

"Uneasy?"

"I think we've missed the point of Gafka's warning."

"Stop worrying," said Laoconia. "The natives won't give us any trouble. Gafka was looking for a last excuse to keep us from attending their Big Sing. You've seen how stupidly shy they are."

"But what if — "

"I've had a great deal of experience in handling native peoples," said Laoconia. "You never have trouble as long as you keep a firm, calm grip on the situation at all times."

"Maybe so. But. . ."

"Think of it!" said Laoconia. "The first humans ever to attend a Rukuchp Big Sing. Unique! You mustn't let the magnitude of our achievement dull your mind. Stay cool and detached as I do. Now get that call off to the ship!"

IT was a circular clearing perhaps two kilometers in diameter, dark with moonshadows under the giant glaze trees. High up around the rim of the clearing, moonlight painted prismatic rainbows along every leaf edge. A glint of silver far above the center of the open area betrayed the presence of a tiny remote-control floater carrying night cameras and microphones.

Except for a space near the forest edge occupied by Laoconia and Marie, the clearing was packed with silent shadowy humps of Rukuchp natives. Vision caps glinted like inverted bowls in the moonlight.

Seated on a portable chair beside the big pack-floater, Laoconia adjusted the position of the tiny remote unit high above them. In the monitor screen before her she could see what the floater lenses covered — the

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clearing with its sequin glitter of Rukuchp vision caps and the faintest gleam of red and green instrument lights between herself and Marie seated on the other side of the floater. Marie was monitoring the night lenses that would make the scene appear as bright as day on the recording wire.

Marie straightened, rubbed the small of her back. "This clearing must be at least two kilometers across," she whispered, impressed.

Laoconia adjusted her earphones, tested a relay. Her feet ached. It had been at least a four-hour walk in here to this clearing. She began to feel latent qualms about what might be ahead in the nine hours left of the Rukuchp night. That stupid warning. . .

"I said it's a big clearing," whispered Marie.

Laoconia cast an apprehensive glance at the silent Rukuchp figures packed closely around. "I didn't realize there'd be so many," she whispered. "It doesn't look to me as though they're dying out. What does your monitor screen show?"

"They fill the clearing," whispered Marie. "And I think they extend back under the trees. I wish I knew which one was Gafka. I should've watched when he left us."

"Didn't he say where he was going?"

"He just asked if this spot was all right for us and if we were ready to help them."

"Well, I'm sure everything's going to be all right," said Laoconia. She didn't sound very convincing, even to herself.

"Isn't it time to contact the ship?" asked Marie.

"They'll be calling any — " A light flashed red on the panel in front of Laoconia. "Here they are now."

SHE flipped a switch, spoke into her cheek microphone. "Yes?"

The metallic chattering in Laoconia's earphones only made Marie feel more lonely. The ship was so far away above them.

"That's right," said Laoconia. "Transmit your record immediately and ask Kampichi to make an independent study. We'll compare notes later." Silence while she listened, then: "I'm sure there's no danger. You can keep an eye on us through the overhead lenses. But there's never been a report of a Rukuchp native offering violence to anyone. . . Well, I don't see what we can do about it now. We're here and that's that. I'm signing off now." She flipped the switch.

"Was that Dr. Baxter?" asked Marie.

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"Yes. Helen's monitoring us herself, though I don't see what she can do. Medical people are very peculiar sometimes. Has the situation changed with the natives?"

"They haven't moved that I can see."

"Why couldn't Gafka have given us a preliminary briefing?" asked Laoconia. "I detest this flying blind."

"I think it still embarrasses him to talk about breeding," said Marie.

"Everything's too quiet," hissed Laoconia. "I don't like it."

"They're sure to do something soon," whispered Marie.

As though her words were the signal, an almost inaudible vibration began to throb in the clearing. Glaze leaves started their sympathetic tinkle-chiming. The vibration grew, became an organ rumble with abrupt piping obligatto that danced along its edges. A cello insertion pulled a melody from the sound, swung it over the clearing while the glazeforest chimed louder and louder.

"How exquisite," breathed Marie. She forced her attention onto the instruments in front of

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her. Everything was functioning.

The melody broke to a single clear high note of harmonic brilliance — a flute sound that shifted to a second phase with expanded orchestration. The music picked up element after element while low-register tympani built a stately rhythm into it, and zither tinkles laid a counter-point on the rhythm.

"Pay attention to your instruments," hissed Laoconia.

Marie nodded, swallowing. The music was like a song heard before, but never before played with this perfection. She wanted to close her eyes; she wanted to submit entirely to the ecstasy of sound.

Around them, the Rukuchp natives remained stationary, a rhythmic expansion and contraction of bellows muscles their only movement.

And the rapture of music intensified.

MARIE moved her head from side to side, mouth open. The sound was an infinity of angel choirs — every sublimity of music ever conceived — now concentrated into one exquisite

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distillation. She felt that it could not possibly grow more beautiful.

But it did.

There came a lifting-expanding-floating . . . a long gliding suspenseful timelessness.

Silence.

Marie felt herself drifting back to awareness, found her hands limply fumbling with dials. Some element of habit assured her that she had carried out her part of the job, but that music . . . She shivered.

"They sang for 47 minutes," hissed Laoconia. She glanced around. "Now what happens?"

Marie rubbed her throat, forced her attention onto the luminous dials, the floater, the clearing. A suspicion was forming in the back of her mind.

"I wish I knew which one of these creatures was Gafka," whispered Laoconia. "Do we dare arouse one of them, ask after Gafka?"

"We'd better not," said Marie.

"These creatures did nothing but sing," said Laoconia. "I'm more certain than ever that the music is stimulative and nothing more."

"I hope you're right," whispered Marie. Her suspicion was taking on more definite shape . . . *music, controlled sound, ecstasy of controlled sound* . . . Thoughts tumbled over each other in her mind.

Time dragged out in silence.

"What do you suppose they're doing?" hissed Laoconia. "They've been sitting like this for 25 minutes."

Marie glanced around at the ring of Rukuchp natives hemming in the little open space, black mounds topped by dim silver. The stillness was like a charged vacuum.

More time passed.

"Forty minutes!" whispered Laoconia. "Do they expect us to sit here all night?"

Marie chewed her lower lip. *Ecstasy of sound,* she thought. And she thought of sea urchins and the parthenogenetic rabbits of Calibeau.

A stirring movement passed through the Rukuchp ranks. Presently, shadowy forms began moving away into the glazeforest's blackness.

"Where are they going?" hissed Laoconia. "Do you see Gafka?"

"No."

The transmission-receive light flashed in front of Laoconia. She flipped the switch, pressed an earphone against her head. "They just seem to be leaving," she whispered into the cheek microphone. "You see the same thing we do. There's been no movement against us. Let me call you back later. I want to observe this."

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A Rukuchp figure came up beside Marie.

"Gafka?" said Marie.

"Gafka," intoned the figure. The voice sounded sleepy.

Laoconia leaned across the instrument-packed floater. "What are they doing now, Gafka?" she demanded.

"All new song we make from music you give," said Gafka.

"Is the sing all ended?" asked Marie.

"Same," breathed Gafka.

"What's this about a new song?" demanded Laoconia.

"Not have your kind song before correct," said Gafka. "In it too much new. Not understand we how song make you. But now you teach, make right you."

"What is all this nonsense?" asked Laoconia. "Gafka, where are your people all going?"

"Going," sighed Gafka.

Laoconia looked around her. "But they're departing singly . . . or . . . well, there don't seem to be any mated pairs. What *are* they doing?"

"Go each to wait," said Gafka.

And Marie thought of caryocinesis and daughter nuclei.

"I don't understand," complained Laoconia.

"You teach how new song sing," sighed Gafka. "New song best all time. We keep this song. Better much than old song. Make better — " the women detected the faint glimmer-haze lidding of Gafka's vision cap — "make better young. Strong more."

"Gafka," said Marie, "is the song all you do? I mean, there isn't anything else?"

"All," breathed Gafka. "Best song ever."

Laoconia said: "I think we'd better follow some of these. . ."

"That's not necessary," said Marie. "Did you enjoy their music, Dr. Wilkinson?"

"Well. . ." There appeared to be embarrassment in the way the older woman turned her head away. "It was *very* beautiful."

"And you *enjoyed* it?" persisted Marie.

"I don't see what. . ."

"You're tone deaf," said Marie.

"It's obviously a stimulant of some sort!" snapped Laoconia. "I don't understand now why they won't let us. . ."

"They let us," said Marie.

LAOCONIA turned to Gafka. "I must insist, Gafka, that we be permitted to study all phases of your breeding process. Otherwise we can be of no help to you."

"You best help ever," said Gafka. "Birthrate all good now. You teach way out from mixing of music." A shudder passed upward through Gafka's bellows muscles.

"Do you make sense out of this?" demanded Laoconia.

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"I'm afraid I do," said Marie. "Aren't you tired, Gafka?"

"Same," sighed Gafka.

"Laoconia, Dr. Wilkinson, we'd better get back to the hut," said Marie. "We can improvise what we'll need for the Schafter test."

"But the Schafter's for determining *human* pregnancy!" protested Laoconia.

The red light glowed in front of Laoconia. She flipped the switch. "Yes?"

Scratching sounds from the earphones broke the silence. Marie felt that she did not want to hear the voice from the ship.

Laoconia said: "Of course I know you're monitoring the test of . . . Why should I tell Marie you've already given Schafter tests to yourself . . ." Laoconia's voice climbed. "WHAT? You can't be ser. . . That's impossible! But, Helen, we . . . they . . . you . . . we . . . Of course I . . . Where could we have . . . Every woman on the ship. . ."

There was a long silence while Marie watched Laoconia listening to the earphones, nodding. Presently, Laoconia lifted the earphones off her head and put them down gently. Her voice came out listlessly. "Dr. Bax . . . Helen suspected that . . . she administered Schafter tests to herself and some of the others."

"She listened to that music?" asked Marie.

"The whole universe listened to that music," said Laoconia. "Some smuggler monitored the ship's official transmission of our recordings. Rebroadcast stations took it. Everyone's going crazy about our *beautiful* music."

"Oh, no," breathed Marie.

Laoconia said: "Everyone on the ship listened to our recordings. Helen said she suspected immediately after the broadcast, but she waited the full half hour before giving the Schafter test." Laoconia glanced at the silent hump of Gafka standing beside Marie. "Every woman on that ship who could become pregnant is pregnant."

"It's obvious, isn't it?" asked Marie. "Gafka's people have developed a form of group parthenogenesis. Their Big Sing sets off the blastomeric reaction."

"But we're humans!" protested Laoconia. "How can. . ."

"And parts of us are still very primitive," said Marie. "This shouldn't surprise us. Sound's been used before to induce the first mitotic cleavage in an egg. Gafka's people merely have this as their sole breeding method — with corresponding perfection of technique."

Laoconia blinked, said: "I wonder how this ever got started?"

"And when they first encountered our *foreign* music," said Marie, "it confused them,

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mixed up their musical relationships. They were fascinated by the new musical forms. They experimented for new sensations . . . and their birthrate fell off. Naturally."

"Then you came along," said Laoconia, "and taught them how to master the new music."

"Exactly."

"Marie!" hissed Laoconia.

"Yes?"

"We were right here during that entire. . . You don't suppose that we . . . that I . . ."

"I don't know about you," said Marie, "but I've never felt more certain of anything in my life."

SHE chewed at her lower lip, fought back tears. "I'm going to have a baby. Female. It'll have only half the normal number of chromosomes. And it'll be sterile. And I. . ."

"Say I to you," chanted Gafka. There was an air of sadness in the singsong voice. "Say I to you: all life kinds start egg young same. Not want I to cause troubles. But you say different you."

"Parthenogenesis," said Laoconia with a show of her old energy. "That means, of course, that the human reproductive process need not . . . that is, uh . . . we'll not have to . . . I mean to say that men won't be. . ."

"The babies will be drones," said Marie. "You know that. Unfertile drones. This may have its vogue, but it surely can't last."

"Perhaps," said Laoconia. "But I keep thinking of all those rebroadcasts of our recordings. I wonder if these Rukuchp creatures ever had two sexes?" She turned toward Gafka. "Gafka, do you know if. . ."

"Sorry cause troubles," intoned Gafka. The singsong voice sounded weaker. "Must say farewell now. Time for birthing me."

"*You* are going to give birth?" asked Laoconia.

"Same," breathed Gafka. "Feel pain on eye-top." Gafka's prehensile legs went into a flurry of digging in the ground beside the floater.

"Well, you were right about one thing, Dr. Wilkinson," said Marie. "She-he is not a *him*."

Gafka's legs bent, lowered the ovoid body into the freshly dug concavity in the ground. Immediately, the legs began to shrink back into the body. A crack appeared across the vision cap, struck vertically down through the bellows muscles.

Presently, there were two Gafkas, each half the size of the original. As the women watched, the two half-sized Gafkas began extruding new legs to regain the normal symmetry.

"Oh, no," whispered Marie.

She had a headache.

— FRANK HERBERT

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ZOOLOGY 2097

Trial-and-error familiarization with new life-forms is dangerously impractical on a far planet, where the representation of Earth men may be a solitary five-man crew. The loss of even a single man constitutes, in effect, obliteration of one-fifth of that planet's Earth-population. This is the "why" of the Space Zoologist.

The science of Contact came into being as a result of a government-subsidized "crash" program in the early seventies, following on the heels of the disastrous second Mars landing.

The first flight to Mars had been simple in intent. The job of the men on board had been merely to land in one piece and radio the joyous news back to Earth, to take some samplings of soil and air, some photographs and then return to Earth. All this was accomplished without incident.

It was the second Mars landing that occasioned the discovery of the quilties. These furry beasts, somewhere between marmosets and koalas in appearance save for overall bright orange and green tangles of fur, were found to be friendly, and unanimously adopted by the crew members as mascots and pets. The animals, disarmingly akin to ambulant rag-toys cut from patchwork counterpanes, did indeed deserve the nickname of "quilties". They were cuddly, friendly, with sad eyes and mournful squeaky voices that endeared them to all the men on that flight.

Fortunately, their discovery was radioed back to Earth along with the usual information in that first day's report. There were no subsequent messages.

Mars Flight Three found the remains of the crew where the quilties had left them.

On investigation by the ship's doctor, it was found that the biology of the quilty was similar to that of a hornet, and they considered man — as they would anything warm and fleshy — in the relative position of a caterpillar. During the cuddling with the small beasts, minute hairlike spines at the base of the quilties' tails had managed to prick the flesh of the crewmen. By the following morning, the men had been eaten to death from within by the grubs of gestating baby quilties.

All of this, of course, is common knowledge today. But it is mentioned here solely to demonstrate to you the monumental hazards which an astronaut had to encounter in the days before the discovery of Contact, and the development of the Space Zoologist, without whose training, courage and efforts extra-Terran colonization would be next to impossible.

"CONTACT — Its Application and Indigenous Hazards"
by Lt. Commander Lloyd Rayburn,
U. S. Naval Space Corps

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A man who lived three lives? A piker! Jerry Norcriss lived hundreds — all over the Galaxy!

By JACK SHARKEY Illustrated by SCHELLING

ARCTURUS TIMES THREE

LIEUTENANT Jerry Norcriss stood at the edge of the wide green clearing, sniffing contentedly of the not-unpleasant air of Arcturus Beta. Three hundred yards behind him, crewmen and officers alike labored to unload the equipment necessary for setting up camp for this, their first night on the planet.

No one had asked him to lend his strong back to the proceedings. Space Zoologists were never required to do anything which might sap, even slightly, any of their physical energies. Moreover, they were under oath *not* to take any orders to the contrary.

Now and then, a hot-shot pilot would feel resentment at the zoologist's standoffish position, and take out his feelings with a remark like, "Would you pass the sugar, if you don't think it would sprain your wrist, sir?" Such incidents, if reported back to Earth, inevitably resulted in the breaking of the pilot, and his immediate removal from command. It was seldom the zoologist himself who made the report. Any crew member who overheard such statements would make the report as soon as possible, no matter what feelings of loyalty they might otherwise have for the pilot or person who had spoken.

From the moment of landing,

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the lives of every man aboard a ship were in the hands of the Space Zoologist.

From Captain Daniel Peters, the pilot, down to Ollie Gibbs, the mess boy, there was nothing but respect for Jerry Norcriss, and no envy whatsoever for the job he would soon be doing. That is not to say they were on friendly terms with him, either.

It was the next thing to impossible to call a Space Zoologist "friend." Even amongst themselves, the zoologists were distracted, bemused, withdrawn from their surroundings. After their first Contact, they never were able to join in amiable camaraderie with other men. Such social contact was not forbidden them. It was merely no longer a part of their inclination. In their eyes a cool, silvery light shimmered, an inner light that marked them for the ultimate adventurers they were. No person would ever suffice them. They lived only for the job they did. Without it, few lived longer than a terrestrial year. Even with it, there was often sudden death.

Jerry was barely thirty, but his thick shock of hair was almost totally white and his mouth a firm line which never curled in a smile nor twisted in a frown. At the edge of the clearing, his bronzed flesh glowing ruddily in the failing sunset light of Arcturus, he stood and waited. Off in the distance behind him, Daniel Peters started across the clearing from the sunset-red gleaming of the sleek metal spaceship.

He drew abreast of the solitary figure, and said respectfully, "All in readiness, sir."

The words reached Jerry as from across a void. He turned slowly to face the other man, focusing his will with the effort it always took just to use his voice.

"Thank you, Captain," he said.

That was all he said, but as he followed Peters across the clearing toward the scorched circle where the great ship had descended on its column of fire, the pilot could not suppress a shudder. Jerry's voice was oddly disconcerting to the nervous system of the listener. It seemed like the "ghost-voice" of a medium at a seance. The mind that was Jerry Norcriss was only utilizing a body for the purpose of speaking. It did not actually belong there.

And that was true enough. Jerry and the others of his kind no longer lived in their bodies. They merely existed there, waiting painfully for the next occasion of Contact.

BESIDE the ship's ladder, hooked to an external power-outlet beneath a metal flap on one towering tailfin, was the

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couch and the helmet Jerry Norcriss would use.

Jerry lay back with the ease of long habit and adjusted the helmet-strap beneath his chin, as Peters read to him mechanically. The data came from the translated resumé of the roborocket that had gathered data on Arcturus Beta for the six months prior to the landing of the spaceship.

"... three uncatalogued species," his voice droned on. "An underground life-pulse in the swamplands near the equator; the creature could not be spotted from the air ... A basically feline creature, also near the equator, but in a desert region, metabolism unknown ... And pulses of intelligent life, and of some unfamiliar lower animal life, on the northern seas ... All other life-forms on the planet conform to previously discovered patterns, and can be dealt with in the prescribed manners."

A small section of Jerry Norcriss's mind found itself mildly amused, as always, by this bit of formality. The outlining of the planetary reconnaissance to a Space Zoologist was mere protocol, a holdover from the ancient custom of briefing a man who was about to undergo a mission of importance. Vainly did the zoologists try to convince authority that this briefing was futile. A man in Contact was no longer a man. He *was* the creature whose mind he inhabited, save for a miniscule remnant of personal identity. His job was to Learn the creature from the inside out. As his mind, off in the alien body, Learned, the information was relayed via the Contact helmet to an electronic brain on the ship, to be later translated into code-cards for the roborockets.

Man's expansion throughout the universe was progressing faster than his mind could memorize or categorize.

The roborockets obviated his need to learn. For every known kind of alien-species problem, there was a solution. The scannerbeams of the rocket would sense each life-form over which they passed, in the rocket's six-month orbit about the planet. If all species conformed to already known types, then a signal would fly by ultrawave across the void to Earth, declaring the planet fit for immediate colonization. But if new species were encountered, the beam to Earth carried a hurried call to the Naval Space Corps, with a request for the next available zoologist.

Zoologists spent their Earth-side time at Corps Headquarters, in the Comprehension Chamber. There, with the millions of index-cards at fingertip control, they lay back upon their couches and

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learned, through dreamlike vicarious playbacks, about the species Contacted by their confreres. Any Space Zoologist with even five years' service had more accumulated knowledge in his brain than any dozen ordinary zoologists. And more intimate knowledge, too. A man who has *been* an animal has infinitely more knowledge of that animal than a man who has merely dissected one.

SO JERRY lay there, letting his ears record the voice of the pilot but closing his conscious mind to the import of the words. It never did any good to know that the creature you were about to be was unknown. And no comment on what sort of animal it *might* be could be half so informative as actually *being* what it was.

Jerry repressed an urge to fidget. This was almost the worst part of Contact: The wait, while the senseless briefing took place. Soon enough he would know more of the species under observation than could be held on ten reams of briefing-sheets. Soon enough he would be sent, for an irreducible forty minutes, into the mind of each of the creatures to be learned.

The irreducible time-extent of Contact was its primary hazard. When the Contact helmet had been developed, it had been found that approximately forty minutes — forty-point-oh-three minutes, to be exact — had to be spent in the creature's mind. No amount of redesigning, fiddling or tinkering could change that time. The Zoologist could spend neither more nor less than that amount in a creature's mind.

Since all creatures have natural enemies, Contact called for more than simply curling up and relaxing inside the alien mind. The zoologist's host-alien might have a metabolism which called for it to drink a pint of water every fifteen minutes or shrivel. In which case the zoologist would shrivel with it, his punishment for not sufficiently Learning his host.

This, then, was the reason those irreducible forty minutes were a hazard. Should the creature being Contacted die, the zoologist died with it. There was no avoiding death if it came to the inhabited creature. A good zoologist Learned fast, or perished. Which is why there is no such thing as a bad Space Zoologist. You're either a good one or a dead one.

Peters' voice came to a halt and he closed the plastic folder over the briefing-sheet.

"That's about the size of it, sir," he said. "We've focused the Contact-beams toward the indicated

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areas and made a final check of all the wiring, tubes and power-sources."

Jerry sighed contentedly and shut his eyes.

"Whenever you're ready, then, Captain," he whispered, and relaxed his body in preparation for his first Contact. His mind and imagination toyed a moment with brief fancies about his forthcoming existences in swamp, desert and sea, then he pushed the thoughts away and let his mind go empty.

Faintly, he heard Peters calling an order to the technician within the spaceship —

Then silent lightning flashed across his consciousness.

II

HE OPENED his eyes. Six eyes. In two rows of three eyes each.

He did not, however, see six images. The widespread belief in the multitudinous images seen by the faceted eyes of a housefly had been debunked the first time a helmeted biochemist had intruded upon that insect's puny brain. As with human eyes, the images were fused into a whole when they reached the mind. Save for the disconcerting sensation of possessing a horizontal and vertical peripheral vision of approximately three hundred degrees sight was comfortably normal.

Jerry looked over his surroundings and noted one slightly annoying side-effect of his hexafocal outlook. As a human will see — as when looking at the tip of a pencil pointed at the face — two images at the far end of any object looked upon, so Jerry, while able to zero in anywhere he chose, could see six ghost-images corresponding in their angle of perspective to the positions of his six eyes. Had he a pencil-tip to stare at, it would have appeared, beyond the tip, to be vaguely like a badminton bird seen head on, with images of the pencil-body comprising the "feathers."

A few moments of glancing about soon took care of the primary irritation of this unfamiliar sensation, and Jerry began to study his surroundings carefully.

He was inside a circular cavity of some sort, facing toward brightness at the opening ahead of him. The walls of the cavity were dark, sandy-smooth and slightly moist, so he reasoned he was in some sort of burrow in the soil. Beyond the opening, there was light and warmth and a hint of greenery which his host's eyes could not bring into sharp focus.

"I wish I knew my size," he thought. "Am I some small insect awaiting a victim, or a rabbit-souled mammal hiding from a

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predator, or a lion-sized carnivore sleeping off a heavy meal?"

Attempts to turn his head for a look at his host's body availed him nothing. Jerry relaxed for a moment, and tried to sense his body by *feel*. He had, he knew in a moment, no neck. Head and torso were a one-piece unit, or at least inflexibly joined.

Carefully, Jerry moved his right "hand" out before his face for a look. He saw a thin, flesh-covered bony limb, with a double "elbow," terminating in a semi-circular pad which seemed suited for nothing but support. No claw, talon or digit on the pad; just a tesselated rubbery bottom, the tesselations apparently acting as treads do on a tire.

"Whatever I am," Jerry sighed, "I'm non-skid." He considered a moment, then added, "I can't be an insect, then. Insects can't rely on weight to keep them rightside up, and need gripping mechanisms. Okay, insect-size is out."

JERRY extended the pad before him and cautiously leaned his weight on it, then removed it back beneath his torso and studied the earth where it had rested. There was a concavity there, corresponding to the pad. It was not especially deep.

"Well, that lets out elephant-size," he reasoned, "and most oversize forms. I must be somewhere between a mouse and a middle-sized wolf. But *what* am I?"

Jerry tried breathing. Nothing happened; there was no sense of dilation anywhere in his body. "Odd," he thought. "Unless I get oxygen — or whatever gases this creature breathes — through my food . . . Or maybe I have air-tubes like an insect's . . . No, I'd have to shift my body now and then for air circulation, and I feel no discomfort remaining still. Besides, I have flesh, and that tube arrangement only functions well in a body with an endoskeleton. Must be dependent on food intake, then. Stores its oxygen or whatever."

He extended the tesselated pad, and rubbed it cautiously against the soil. There was a dim sensation of touch in the pad. But it was subordinate to a soma-centric sense of location. His pad "knew" where it was in relation to his body, but had no great tactile capacity for his surroundings. "Well," Jerry thought, "that lets out *feeling* my body to determine shape or function."

As it sometimes did when he was enhosted, his mind went back to old Peters, his instructor, who had taught "Project C" to the eager young zoologists. Project Contact had been mostly devoted to giving the student an open mind on metabolism and adapta-

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bility to environment. A Learner had to be able to reason out — and quickly — the metabolism of his host. It was little use knowing a Terran life-ecology; man lives on combustibles and oxygen, the oxygen combining with combustibles to provide heat, and plants live on carbon dioxide and water and sunlight, renewing the atmospheric oxygen. So old Peters had always stressed the student's learning their Basic Combinations.

Basic Combinations prepared the student — or so the school board hoped — for a wide variety of chemical relationships between a host and its environment. The students had to know what to do to survive should the host, for instance, live in a chlorine atmosphere, and need large amounts of antimony in its diet for proper combustion and survival. There were a good many chemical elements in the universe; the student had to know how to deal with any combination of them in a host's metabolism.

For the most part, the instincts of the host would carry a Learner through the Contact period. A species tended to keep its physical needs not only in its mind, but in its body as well. Mr. Peters had a saying he'd been fond of emphasizing to the students: "When in doubt, black out." The saying became a cliche to the student body, but they had the sense not to disregard it. A cliche is, after all, only a truth which has become trite because it is vitally necessary to use it often.

"When in doubt, black out," meant simply that if a situation arose which seemed impossible to handle rationally, the enhosted Learner's last resort was reliance upon the instinctive behavior of the host. The only thing to be done was to pull the mind into a tiny knot bobbing in the host's own brain, and let the host itself, once more in control, take the Learner instinctively to environmental victory. Or defeat.

THERE were dangers, of course. A Learner enhosted in a chicken, for instance, would be a fool to trust the chicken's instincts regarding, say, a snake. A chicken confronted by a snake tends to become hypnotized by its deadly adversary, and to stand stupidly in place until it is killed. In cases of that sort, the Learner would be safer taking control and going clucking off to the nearest high ground.

On the other hand, a Learner inhabiting something with the hairtrigger instincts of a bat would be much better off letting the animal's instincts take over in moments of grave risk, such as flying through the blades of a

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revolving fan. A bat could get through without a second thought about those whirling metal scythes, but a man's mind could not think fast enough to avoid a grim death by all-over amputation.

"Maybe," Jerry thought hopefully, "I've got an *easy* one." It was possible, of course. His host might be in the midst of an afternoon siesta, and Jerry could relax and "sit out" his forty minutes of Contact. But such cases were few. At any moment a predator might come down into that orifice in the soil, and Jerry would have to fight for his host's life to preserve his own. Relaxed Learning was seldom feasible.

"I'd better see what sort of fighting equipment I have," he decided, wishing vainly that he could just turn his head and look his body over. This proceeding by *feel* was a slow, tortuous, and sometimes deceptive process. Hollow fangs that seemed capable of injecting venom into an enemy might — as in the case of the Venusian Sea Vampires — turn out to be an organ for drinking water, the sacs above the fangs being for digesting liquids and not for storing poisons.

Jerry stimulated what should be his tongue into action, checking for the presence of fangs. Within the mouth of the creature, which felt large in relation to its head, he sensed a rasping movement, a kind of dull dry rustling, but could feel nothing with the tongue itself. "Best have a look at it," he decided suddenly, and, opening his jaws, extended the tongue.

JERRY was distinctly shocked by the thing that skewed and writhed forward from beneath his eyes. His sensation was not unlike that of a man who opens his mouth and finds a snake in it. And Jerry further realized that he was now seeing with another sextet of eyes, at the end of the tongue.

He was not one alien — he was two!

His primary six eyes took in the pink-and-gray horror extending ahead of him. The tongue was almost like another animal, serpentine in construction, and had two horny — what? — arms? — pincer-jaws? — at either side of the "head". They were tubular, like a cow's horns, and lay at either side of a wide slit-mouth in the tongue itself.

On impulse, Jerry swiveled the tip of the tongue back upon itself, and gazed through the six eyes around the tongue-slit-and-jaws/arms at the main body of his host. Then, suddenly feeling ill, he snapped the tongue back into his mouth and shut his jaws.

It had been a horrible sight. Where he'd expected to see the

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abdominal region of his host, just behind the thoracic section, there lay a wet, red concavity, in the midst of gaping jaws. Jerry himself was enhosted in a "tongue" of some still larger creature within that soft earthen burrow! And some remaining fragment of his host's awareness told him that the creature of whom he was the tongue was itself the tongue of yet another creature. He was a segment of some gigantic segmented worm-creature whose origin lay who-knows-how-far beneath the earth.

Carefully, stilling a mental feeling akin to *mal de mer,* he reprotruded his tongue and looked more carefully at it. Sure enough, just behind the "head" of the thing were two stubby growths, not yet mature. In time, Jerry realized, those growths would develop into a pair of double-elbowed front "arms" with semi-tactile tesselated pads at the base, and the curving jaws/arms would drop off or be resorbed, while that "tongue" extended a "tongue" of its own.

"And then what happens to *my* segment?" he wondered. "Do I simply lie here forever with jaws agape?"

As he pondered this, there came a movement in the greenery just beyond the burrow orifice. A squiggly thing with an ill-assorted tangle of under-appendages came prancing with almost laughable ill-balance into view. Jerry, intent on observing this creature — very like a landbound jellyfish walking clumsily upon its dangling arms — relaxed his vigil as regards control of the host.

Before he realized it, his jaws were flung wide, and that self-determined tongue was leaping for its prey. The horny jaws/arms clamped into the viscous body of the passing creature, and the slit-mouth extended upper and lower lips like pseudopods to cover the writhing, squealing victim. Then a huge lump appeared in the tongue, just behind its "head." Jerry waited with a distinct lack of relish for the still squirming "meal" to make its alimentary way back into his own esophagous.

However, it did not. Just short of his lips, it halted. And after a few moments, it ceased to struggle.

Annoyed, but uncertain just why he was, Jerry attempted to re-mouth his tongue. It did not come back. His jaws lay open wide, and his tongue remained where it had shot forward to grasp the tentacled creature.

Something clicked in Jerry's mind, and he once more tried "seeing" out of the tongue's six eyes. He found that he still could, but dimly.

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It took him about three seconds to figure out his peril.

THE SEGMENT behind his own would never re-swallow *his* segment, which had been its tongue. It couldn't. It was dead. For the time-period in which his own segment had existed as the third segment's tongue, it had some control over it. It could extend the tongue, and could see through the eyes in the tongue. But then Jerry's segment had fed, had grown, and the parent-segment had died, as had its parent-segments before it. The thing, whatever it was, grew fast, too.

That was the frightening part.

Even while he thought this, he saw that the lump was gone from his tongue. But his tongue was twice the size it had been!

Repeated efforts on his part to withdraw it back within his jaws met with failure. Again he tried looking through its eyes, and found his tongue-vision even dimmer. Then with a tremor of shock, he realized that his own vision was dimmer, too.

His host was dying. It was no longer needed to house the tongue.

Up ahead of him, the tongue-part was digging busily with those pincers, erecting for itself an extension of the burrow. Like a mole in reverse, it did not make a mound by tunneling through the soil, but by lying atop the soil and erecting itself a circular tunnel in which to await victims.

Jerry's mind brought to him a vision of what this section of this unknown morass must look like, with miles and miles of curving tunnels, each housing a hideous worm-creature, of whom all segments were dead except the front one, which would in turn be dead as soon as its tongue had fed a bit and grown to mature size.

Shivering within his mind, Jerry wondered how much of the forty-minute period had gone by.

He had no way of estimating. His personal time-sense was overpowered by that of his host. A man within a gnat, with the life-span of a day, would feel subjectively that he had lived a lifetime within it, although only those same forty minutes would pass by until his return to his own body, helmeted upon the couch.

Each new segment might take a day to grow, or it might take a few minutes. Jerry could not tell. He could only wait until he was sent to his next Contact. There was no method of self-release from Contact. That was why survival was imperative.

A flicker of movement caught his dimming vision, and he realized that his tongue had snared yet another of the jellyfish-things.

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The second lump was quickly absorbed as he watched, and he found he could no longer make contact at all with the six eyes of the tongue-tip. His own six were blurring, with a rapidity he was able to observe, and he knew that the life of the host could not last very long.

Vaguely, he was aware that the stubby growths of his tongue had now sprouted into appendages such as his own. The tongue could no longer be called that, because it was nearly a full-grown segment. Within it, he imagined, it was growing a new tongue of its own, the faster to hasten its own eventual demise.

"I'VE got to stop it," he thought. "But how can I? It won't withdraw, no matter how hard I try. And if it would, it's grown too large to fit inside my jaws any more, even if I tried cramming it in with these stupid pads of mine . . ."

He stopped the pointless line of reasoning and lifted his pair of double-elbowed "arms" before his failing sextet of eyes.

"They look strong enough, but are they?"

He could feel his control slipping. His life would hang upon the success or failure of his experiment, but there was no time to try and reason out a better attempt at survival.

Swiftly, ignoring the wriggling protests of the segment before his own, he encircled it tightly with those two-jointed "arms" and held it tight and painfully taut. It was still soft, still relatively raw from its rapid growth, and was not equipped to fend off attack from the rear. Jerry, straining terribly, ignoring the searing pain that licked his consciousness, cruelly and methodically tore out what had been his tongue.

The dripping end of the thing flopped once, then lay still. And Jerry's vision, after swimming in gray haze for a moment, coalesced once more into sharp focus and he knew his host was alive again.

"Whew!" he gasped, grateful to shut the great jaws once more. "It'll be tough, but I know how to survive, now. My segment's low enough on the evolutionary scale to regenerate lost parts; it will grow itself a new tongue. If I don't get lifted to a new Contact in the meantime, I'll simply tear *that* one out, too, and hang on until I get *out* of this damned thing!"

Then the segment ahead of him moved, and Jerry knew cold fear.

At the mouth of the burrow, one of the squiggly jellyfish-things had inserted a tentacle into the burrow and was busily ingesting the torn-out segment into a gaping hole in its underside amongst

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the shiny, wiggling arms. Even as he watched, it had completed its meal, and with a shiver of gustatory pleasure, readjusted its relative dimensions until it was three times its former size.

"This," said Jerry, bitterly, "is one hell of an ecology. Each creature is the other's chief natural enemy!"

Then his fright grew as he saw that the jellyfish — he could no longer think of it as anything else — was methodically ripping down the walls of the burrow, and coming for *him*.

Frantically, Jerry tried getting at the thing with his tongue, but the raw stump within his jaws was still in the process of generating a new head-and-eyes part. A mere stub shot forward to wag futilely at the approaching enemy.

Jerry shot his tesselated pads forward, trying to push and pummel the thing away, but the few blows that landed rebounded from that shiny body like pithballs bouncing from an electrostatic plate.

Then the jellyfish grappled with, and held onto, one of Jerry's arms, and began calmly to tuck it into its digestive cavity. If the pad had been only lightly tactile before, it became supersensitive now, as the creature's digestive juices began to erode it into its component chemicals.

Jerry felt as if he'd rammed his hand into an open wood fire. He tried to scream; nothing emerged between his jaws except that futile tongue-stump. The jellyfish, climbing in a leisurely fashion down the limb it was ingesting, flicked out a tentacle and began doing something horrible to Jerry's upper right eye. It sent waves of pain into his mind, and almost blotted out all thought, except for a maniac notion that urged Jerry to laugh at the creature's ambition. For its highly maneuverable tentacle-tip was diligently attempting to *unscrew* the eye.

Jerry's right arm was gone. Tentacles flipped and floundered all about his head-section. The digestive cavity of the jellyfish was widening, trying to take in Jerry's head at a single swallow. He saw, with the five usable eyes remaining, a crystally concavity, the sides glinting with digestive fluid tinted beautiful emerald by the foliage out beyond its semi-transparent body. Then the thing closed over his head, and the last of the eyes began to sear and sting.

Jerry's mind cried out in anguish . . . and lightning flashed across his consciousness. White, silent lightning.

Pain ceased.

The time of Contact had passed.

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III

CAPTAIN Daniel Peters paced agitatedly back and forth before the couch holding that still figure in its bulky helmet. The last glow of the sunset had vanished behind the trees around the clearing minutes before. Peters took three puffs from a just-ignited cigarette, then crushed the white cylinder under his heel.

"Sir?" said a man at the airlock of the ship.

Peters looked up swiftly, and identified the speaker as the technician for the Contact mechanism.

"How's it going?" he asked, trying to keep his voice matter-of-fact.

"First report's just come in," said the man, with a brief smile. "Information's being coded onto a new card for the roborocket index. I guess Norcriss came through the Contact all right. His life-pulse still shows on the panel. It was flickering badly for a few minutes, though. Think I should terminate?"

Peters hesitated, then shook his head. "No, I guess not. They tell me there are no after-effects to even a hazardous Contact. Norcriss'll be wanting to get on with it . . . poor devil," he added, with a wry smile that touched only his lips, didn't reach his eyes. "Proceed, seaman."

The other man nodded, and vanished within the ship . . .

IV

VAST flat fields of sun-bronzed stone stretched in all direction to the horizon, pockmarked with rimless craters, seething with red liquid which flickered with dusty blue fingers of fire here and there on its surface. Every so often a pale plume of steamy white rose toward the coppery overturned bowl that was the sky.

Cautiously Jerry sniffed the air. Sulphur. That was the red liquid burning in those many pits: Yellow sulphur melted into gluey scarlet pools amid the nearly invisible shimmer of its consuming fires.

"Sulphur doesn't steam," Jerry thought idly, still sniffing at the fumes. "So the white plumes mean there is water, or some volatile liquid, mingled with the deposits in those pits."

After a moment, he realized that he was no longer taking random sniffs of the fumes, but was actually indulging himself in a regular orgy of breathing. The smell of the sulphur was as strong and piercing as he'd ever known it, but absent was the almost simultaneous effect of raw throat,

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streaming eyes, and hacking cough.

"The desert air must be nearly *all* sulphur gases," he realized. That would explain the hue of the sky, and the not-unpleasant silvery haziness of the atmosphere.

"And I, if I don't keel over in a few more moments, must be a sulphur-breathing creature."

Sunlight, from nearly directly overhead, was warm and comfortable upon his head, back and hindquarters. An unusually flexible feeling in the caudal region of his spine told him that he had a tail, even before he swung his huge head about for a glance at it. The body, as bronzed as the rock on which it stood, was something like a lion's, although the taloned feet, from heel to the first leg-joint, were horny and rough in appearance. They were not unlike those of a barnyard fowl, if considerably thicker and decidedly more lethal.

That, save for a hard-to-see fringe of darker fur that ran up his neck toward where he felt his ears to be, was all of his body that he could view.

"I wonder," he mused, "what my head looks like?"

A brief turning of the problem in his mind gave him the solution to it. It wasn't the best possible way of getting an idea of his latest cranial conformations, but — unless there was a looking-glass lying about — it was the only way at hand.

Jerry tilted his head until his eyes fell upon his shadow on the brown rock beneath him. By tilting it from one side to the other, and joining the various silhouettes in his mind by a simple application of basic *gestalt*, he knew what his head looked like.

Very like a lion's, except that it seemed to have no external ear. A single slender silhouette that fell from the forehead region, stiletto-pointed, must be a sort of horn, unless it deciduated periodically, like a deer's antlers.

FURTHER speculation on his appearance was interrupted by the appearance of another creature, trotting like a terrier between the fuming sulphur-pits, coming his way.

It could be a twin to what he now knew he looked like, but it seemed just a bit smaller, somehow. And it was carrying something carefully in its teeth.

"Should I run, fight or just ignore it?" Jerry wondered. "It doesn't seem menacing. But neither does a pekinese till you try to pet it."

He allowed his mind to retreat a fractional bit from control of his host, and watched its reactions to the newcomer. Jerry felt a surge of emotion, a sort

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of fond, proud, doting feeling, and knew that this approaching creature was his cub. "That's a help," he thought, relieved, and resumed control of the animal.

The cub halted a short distance away, and gently set its burden upon the rock, placing a forefootful of talons upon the thing before letting go with its jaws. Under the talons, the thing moved. Jerry saw that it was a sort of squirrel, except that it had well-developed forepaws, the pads of which hinted that it undoubtedly ran quadripedally instead of climbing trees. Then the memory of the sort of terrain he was in re-crossed his mind, and Jerry felt foolish.

Naturally it didn't climb trees in a region that was devoid of any vegetation whatsoever.

Jerry noticed that the cub seemed to be waiting for something. He wished he could speak. He had the goofy feeling that he was supposed to say, like a man confronted by a bottle of Chateau Neuf in the hopeful hands of a wine steward, "That'll do nicely, thank you."

A nod was almost universally a sign of acquiescence, so he tried that instead. The cub seemed pleased, and immediately, by lowering that forehead-horn between a pair of the talons enfolding the struggling land-squirrel, snuffed out its life with a thrust through its neck. Then it removed the talons from its prey, and took a backward step.

Apparently, as the sire, Jerry was to get first bite.

"Now don't go all picayune," he cautioned his digestive tract. "Come on, Jerry boy. You eat oysters while they're alive. You should be able to eat a squirrel when it's dead. Besides, if you like the smell of this lion-creature's atmosphere, you'll probably like the taste of its food. Eat hearty."

With that, Jerry lowered his head and let his sharp teeth snap off a haunch of the squirrel-thing. He went to chew it, then realized that — unlike his prior Contact's over-equipage — he had no tongue. This was strictly a bolt-your-food host. So he tossed his head back, and managed, with a spasmodic effort of his thick muscular throat, to get the morsel into his stomach.

The cub stepped forward then, bit off a chunk for itself and got it down with less apparent effort.

"Well, he's had more practice at tongueless eating," Jerry consoled himself. Then, noting that the cub was standing patiently awaiting something, he swayed his head from side to side, trying to convey, "No thanks, it's all yours, kid."

But the cub, its head tipped perplexedly to one side, was still

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watching him, waiting for something, a sort of puzzled anxiety in its gaze. Jerry reasoned that if he simply backed off, the cub would take that as a gesture of refusal to eat any more, so he took a few steps away from the squirrel-thing.

AND the cub, an almost human look of bafflement on its face, gurgled a whine from its throat. It began to bounce about on its legs like a housebroken dog that very urgently wants out.

Jerry thought hard. The frantic desire of the cub for him to do something was more than mere pettishness on its part. There was real panic in its eyes, now. Jerry felt the first thrill of danger. What was he doing wrong? Or what wasn't he doing *right?*

Mere after-you-Pop protocol could not explain the glint of fright in his cub's eyes. Or could it?

Jerry tried to remain calm and think reasonably. The sire-and-cub relationship was throwing him. Most animals — in the narrow group that remained linked by relationship and affection even after the cubs matured — ran along opposite lines. The parent went out and got food for the kids, and not vice-versa. On this planet, apparently, having a cub was the nearest thing to Social Security.

"Remember, you idiot," Jerry snapped at himself, "this is a species. It is no beast rational mind you are dealing with, but an animal mind. That means that the cub's apparent protocol is instinctive, and not a matter of etiquette. And an instinct has a reason behind it, doesn't it? Only man can skip over protocol. You have to do something before the cub feels that it can do it — and whatever it is you're not doing, it's driving the cub to distraction. You'd better go for a second helping of squirrel, and fast, or you're going to have your kid in a mental institution!"

Not exactly relishing completing the meal, Jerry stepped back to the furry little corpse on the rock, and only as he came near enough to bite into it was he suddenly aware of another odor mingling with that of the sulphur fumes. Unbelieving, he stared at the spreading pool of putrescence that ringed the remains of his cub's prey. He stared, silent and amazed, as flesh and bone crumbled and dissolved there on the ground, until there was nothing there but the noissome liquid and a few tiny teeth.

"Incredible!" thought Jerry. "To decompose so damned fast! But it certainly explains why

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Junior brought me that thing still alive and kicking. It didn't last more than a few minutes after it died — *Ugh!*"

The sickly retch boiled out from his stomach with a painful expansion, and he scented the same foul odor on his breath as arose from the liquid that now lay drying in the burning sunlight.

"The damn thing's going rotten *inside* me!" he said to himself, feeling the first wave of illness shake him from horn to tail-tip.

His flesh, beneath its bronze-colored fur, felt suddenly cold and greasy. Jerry knew that feeling well, from one summer when he'd eaten a sandwich with mayonnaise that had lain too long outside the refrigerator. It was the onset of ptomaine. He and the cub could be dead, in a very ugly manner, within less time than he had to await his next Contact. Or was it less time? It was subjective, wasn't it? Maybe this period would be over more quickly than the last one. Or maybe more slowly . . .

JERRY turned to look at the cub. Its eyes were glazing. It was breathing in gasps through its open mouth, staggering as it tried to remain on its feet.

"We're poisoned," Jerry groaned. "And it's not on purpose. That cub didn't trot here with that squirrel just to knock off its old man! There's something else has to be done, something I've overlooked. And my stupidity is killing us."

Weakly, almost automatically, Jerry's conscious mind did the only thing possible under the circumstances. Cliche of old Peters or not, "When in doubt, black out" was the only solution. Jerry swiftly relinquished his grip on the controls, and let the lion-thing take over its own destiny.

The first thing it did was rush toward the scarlet surface of the boiling sulphur pit near the cub. The muscles relaxed and showed no sign of relaxing in that flame-bound gallop, and Jerry grabbed at its mind and got back in control just as its forefeet stood on the brink of that blue-flaming red pool.

"Oh, damn!" he groaned, agonized by both his fear of fire and the growing discomfort within his stomach. "Of all the creatures in the universe, I have to hit one with the lemming-instinct. This damn thing's bent on boiling itself alive if I let go. And if I stay in control, I die of ptomaine!"

Jerry Norcriss wasted nearly thirty seconds feeling sorry for himself. And then he remembered something about lem-

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mings. And also something about cubs.

Lemmings, those strange little rodents that take it periodically in their heads to all go rushing into the ocean and drown, are not suicide-bent. Their ancestry is older than the continent on which they live. At one time the spot wherein they plunge into the ocean was linked with the next continent over. The migration — for that's what it is with lemmings — had at one time been perfectly safe. So safe that the migration of the lemmings became instinctive. And, after the continents separated, or the band of land joining them sank beneath the sea, the lemmings blithely continued their trek, and perished. Lemmings might die, but the ages-old instinct of the specie wouldn't.

No animal, Jerry realized, is deliberately self-destructive. No animal but man — who is more than animal, and can decide upon his own destiny despite what his instincts buck for.

And cubs, Jerry recalled with chagrin, are not always born knowing survival-tactics. Some cubs have to be taught how to survive. And this one is still in the process of learning, and only senses that — since it is becoming deathly ill — something is horribly wrong. It wants its sire to show it survival, and its sire is in the hands of a nincompoop like me . . .

FORTUNATELY for Jerry and the cub, his thoughts on cubs and lemmings lasted only a fractional second, so all-inclusive is the mind's apprehension of a situation.

And then Jerry, feeling greatly relieved, let go of the controls once more and let the lion-thing bend and drink from the blazing sulphur-pool at its feet.

Of what the host was constructed, Jerry had no idea. Its cell-structure might be high in silicates, or possibly be akin to asbestos. Whatever it was, the blazing red sulphur went down its gullet like sweet warm wine, and the decaying squirrel-thing was transformed into chemicals that were comfortably digestible.

Jerry was glad to see that the cub, standing on shaky legs, was drinking, too. It seemed likely to survive its brush with death.

Not a bad life, he thought. Catch a meal, take a swig of wine and then just loaf around in the sun. Nice planet . . . if you like sulphur, and have a bright-eyed young kid who won't make a move without your approval and example—

Jerry's ruminations were cut short by a sound of leathery wings, high in the coppery sky. Abruptly alert, he lifted his

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shaggy head and saw an ominous formation of Vs in the sky. They grew in size, and became the forms of gigantic airborne things, a cross between the ancient Terran pterodactyl and a sort of saber-toothed ape.

Something told him these approaching things were not friendly.

He turned his head to the cub, but this, apparently, was a lesson already learned, because all he saw of his scion was a disappearing blur of buttocks and tail as the cub scurried in a clumsy gallop across the plains of sunburnt rock. In another instant, Jerry was scurrying right after him, for reasons above and beyond Togetherness.

The paws wouldn't manage right, so he finally dropped back a bit and let the lion-thing's brain take over the job of escape, his own mind merely going along for the ride.

"But where can we *hide?*" he wondered, fascinated despite his fear. "Can we pull the hollow reed routine under the surface of a sulphur-pit? Or are there caves someplace in the vicinity? Or do we just run until either our legs or those simianipters' wings give out?"

Then his mind got entangled with the purely empirical cogitation about the validity of coining a word like *simianipters* (which seemed to mean "ape-winged" when the coinage he desired was "winged-apes") and his mind was bouncing so busily between this knotty problem and the chances of escape from those creatures and the puzzle of just what constituted safety from the flying things that he barely noticed the white flash of silent lightning that heralded cessation of Contact.

V

"CONTACT completed," said the technician to Peters, in the purple twilight slowly deepening to black starry night. "Slight dimming of Norcriss's life-pulse this time, not so bad as last time."

Peters nodded as he ripped open a fresh packet of cigarettes. "Machine functioning properly?"

"Yes, sir," the technician nodded. "Norcriss could go on at least three more Contacts with the power we have left. Shall I activate him again, sir?"

"Go ahead," murmured Peters, his eyes fastened on the pallid face of the young man on the couch . . .

VI

NOISE. Footsteps on metal. Metal meant refined ores, and that in turn meant intel-

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ligence. Yet he *couldn't* inhabit an intelligent mind!

Jerry opened his eyes and took in the scene before him. His vista was oddly diverted into vertical panels, and then, as his mind settled into full control, he knew that the panels were spaces between bars.

The thought crossed his mind that bars must be vertical everywhere in the universe. Horizontal ones would hold a prisoner as well, but the origin of bars lay in primitive stockades, stakes plunged into the ground about a prisoner. Primordial tribal habits were not easily broken, even after attainment of civilization.

Through the bars he saw — well — men. They were at least bipedal, and walked upright, and had two upper limbs with facile digits at the ends, all in keeping with the nearly universal rule of bilateral identity.

Beyond that, the resemblance to man ceased.

The creatures he saw were clothed in satiny uniforms, yet something about the material told him it would hold up under heavy stress. Wherever their actual bodies showed — head and hands, mostly, though a man of apparently lesser rank was bared to the waist, working on a machine set against one wall — they were covered with short (or cropped) white down. Jerry could detect on the heads no sign of ears or nose, but in the midst of the furry expanse of face, tiny green-glinting beads of jet were eyes, and a thin, wide blue-gray slit further down was the mouth.

The hands, he noted with interest, were furred even within the palms. Or so he thought until one of the creatures, idly flexing a hand, showed Jerry that the fingers bent on double joints in either direction. There were no nails as such, but each digit on those deceptively soft-looking hands terminated in a tapering cone of some hard black material, as shiny as the eyes in those coconut-frosted faces.

Jerry once more had cause to regret the impossibility of Contact within a mind of an intelligent creature. Intelligence equated with impenetrability, so far as Contact went. You could learn of an intelligent race only so much as their words and gestures and behavior cared to let you know.

Jerry knew he was in a sea-region, but whether over it, on it, or under it — No. The room, so far as he could see, was windowless. It could mean that the vehicle was carrying its own atmosphere, in order to keep the riders alive, whether the outside surface of the ship were within

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inimical gases or liquids, or the deadly nothingness between planets.

Then again, he might simply be within a fortress, or below sea-level in a ship. Jerry gave it up, and concentrated on himself, and his barred container.

THE CAGE was as high as one-fourth the height of any of the men before it, so Jerry reckoned his own size as about one-sixth. If they were all six-footers, then he must be about rabbit-sized. He glanced down his body and saw hard gray scales over a curving belly, with a pair of hind feet that seemed to be all phalanges and no metatarsals. From "heel" to foot-tip, Jerry had three long, hard-looking black spikes. "Something like a swan's foot with the webbing removed," he mused.

A look at his forepaws before his face showed him three similar phalanges, though only two-thirds the length of the hind ones, and having in addition a sort of stubby rudimentary thumb. His forearms were scaly, too, and possessed a wicked spur of the same black material jutting downward from the elbow.

Happily, three sides of his cage were polished metal walls, so he was able to get an inkling of his facial characteristics in the warped uncertain mirror of the surfaces. He saw startled-looking eyes, round as quarters, with red irises that dilated greatly with each tilt of his head toward the shadowy rear of the cage, and narrowed the orifice about the pupil to a pinprick when he turned near the front. He seemed to be noseless, also. When he tried to sniff, nothing happened. The attempt made his head feel stuffed up, but he knew that the feeling was only inside his mind, and not an actual sensation.

Jerry looked at his mouth. It was just a wide slit in his round, earless head — no, not earless; there were auricular holes under a flange of gray scale — just a wide slit with a glint of sharp-pointed bright orange teeth.

"Well," he thought, "I'm at least a carnivore, possibly an omnivore, with teeth like that. The light in this room is apparently not intolerable to those fur-faces out there. So — if the slight shooting pains in my head plus the shutting of the irises when I face into the room are any criteria — I must be a nocturnal beast of some kind. Eyes like this would be blinded by sunlight."

He decided he was, in the ecology of the fur-faces, something along the lines of a raccoon, even if his flesh were

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scaly as a pangolin's. "Maybe I'm a pet," he hoped. "But there's something about the atmosphere of this room —"

Something rustled and clacked against the wall of his cage.

Jerry withdrew his control a fraction to let the host's mind tell him what it might be. The mind of his host was atingle with antagonism. Yet, as Jerry heard a similar movement somewhere off to the far side, the mind of his host grew suddenly tender and excited.

Jerry re-assumed control, having the information he needed. His cage was one of at least three, possibly many more, housing animals like the one enhosting him. The nearby cage contained an animal of his own sex, the other contained an animal of the opposite sex, possibly a mate. Whether male or female, Jerry had no idea. He had in any Contact — barring a procreative arrangement beyond the simple bisexual — a fifty-fifty chance of being male. The worm had been self-generating, the unicornate lion-thing had been male. What Jerry's present sex was, he had no idea. Even on Earth, scaly creatures tended to baffle all but the experts as to sex. Jerry inspected the mind of his host for a few moments, but could find out only that it yearned for that other one in the other cage. The intensity of the yearning gave no clue if the urge were man-for-woman, woman-for-man, mother-for-child, child-for-parent or — it was barely possible — friend for friend.

Jerry decided to ignore the yearning by taking full control of the host once more. He took stock of his circumstances. Here he was, a nocturnal carnivore, caged with many of his own kind in a vehicle moving through space or water.

He was not just there for the ride, that was certain.

Being delivered somewhere? No, the room beyond the bars looked little like a storage hold. Of course, these fur-faces might have alien ideas about the way a storage hold should look. Still, they seemed to be bosses of some kind. There was no mistaking the dressy look of their uniforms. A high-ranking officer might go into a storage hold, but it would be for an inspection only, and these creatures were busily doing something in the center of the room.

THERE were three of them, discounting the bare-to-the-waist man working on that odd-looking machine. They stood by some waist-high object — two with their backs to Jerry, one in profile — very intently ab-

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sorbed in something on that surface.

Jerry twisted his head about, but could make out no relevant details on that surface. "They could be studying a map laid out on a table," he pondered, curiously. "Or maybe they are shooting dice at a crap table, or—"

Further conjecture was suddenly, and horribly, obviated.

The man at the wall straightened up from his labors and announced something, unintelligible to Jerry (the voice was an unbroken hum that rose and fell in pitch, unarticulated into consonants or vowels), which undoubtedly meant, "She's all fixed." The fur-face in profile turned with quick attention and stepped to the machine. He pulled from its slot a thing like the cable-supported arm of a small crane terminating in a cone-shaped flexible surface, and arranged it over the thing on the table which his movement to the machine had exposed to Jerry's gaze.

The thing on the table was the face of another of the white-furred men, and Jerry suddenly knew that this was an operating room. These men were doctors, involved in surgery.

The machine, so hastily repaired, was some sort of anesthetizing gadget. They'd had to wait for it before proceeding. All this information Jerry worked out with only a small part of his mind; the majority of his concentration was focused upon the other thing he'd seen upon the table, strapped wide-eyed into position beside the patient.

It had scales, sharp orange teeth, and might have been a rabbit-sized cross between a raccoon and a pangolin, and the wide eyes were tightly irised into discs of coppery red, with no visible pupils, under the light that overhung the operating table.

"What the hell is going on here?" Jerry thought, with dismay. "Surgery? In the same room with cages full of animals? What about sanitation? What about infection? The doctors are maskless. The room is only passably clean — certainly not scoured with green soap, alcohol or live steam. And that repairman is standing beside the table scratching his stomach!"

Bewildered, yet drawn to watch with morbid fascination, Jerry ignored the pain that staring into the room brought to his eyes, and gave full attention to the proceedings.

THEY were — from a raccoon/pangolin's viewpoint — pretty ghastly. The men, muttering to each other as medics the uni-

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verse over must while engaged in surgery, started snipping and plucking and sawing and clamping with lackadaisical facility upon the two bodies strapped to the table. One medic concentrated upon the man, the other upon the animal, while the anesthetist merely held the cone lightly upon the patient's face, and glanced now and then at dials upon the machine proper, as if for reassurance, or possibly to show that they were efficient and well-trained.

They did not trouble to anesthetize the animal.

As they shifted about in their work, Jerry got a better look at the patient. All along his chest and belly, the white fur was gone. From the edges of the empty region, Jerry could see that the fur had been scorched away. The surviving fur in the periphery was stunted and slightly carbonized. The "flesh" beneath that exposed region was smooth, excepting a few blistered spots near the center. It resembled thin, flexible green plastic, of the sort that seems to be translucent, but is actually transparent, the darkness of the color tending to make it seem opaque unless light could be placed directly behind it. Into this surface went the scalpels and clamps and pins of the medics, until they had a triangular flap lying back to expose the organs within.

Jerry, well-versed in all the metabolisms available to the scientists of Earth, was completely baffled by this one. None of the internal organs was fastened to anything.

The abdominal hollow of the creature was filled with a clear lemon-colored liquid. The organs just floated within the liquid. They were, Jerry noticed with amazement, not even juxtaposed with any sort of permanence. Even as the medic reached for them, they bobbed and moved about each other in the yellow fluid, as impermanent of locale as apples in a rainbarrel.

Then Jerry had it.

"They're colloidal!" he gasped within his mind. "A tough, flexible outer shell! The whole thing hollow from cranium to fingertip to toe, containing a liquid that acts as reagent, catalyst, suspensor and electrolyte for the mineral crystals, cell globules and chemical coagulates. These fur-faced creatures are nothing more than ambulant, intelligent hunks of protein! The whole setup's there. The lemon-colored fluid is the dispersion medium, and those 'organs' they're lifting out are the disperse-phase. But . . . what do they need the raccoon/pangolin for?"

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His fellow-creature, hissing in agony, was already a glittering, almost formless thing under the grisly tools of the medic standing over it.

It was, Jerry realized, being laid belly-open with no more regard than is given a lobster's tail-muscle by the gourmet with his tiny three-pronged fork.

Jerry could only watch and wonder and wait to see the use to which the animal would be put. He had not long to wait.

ONCE laid open, the animal's internal fluid, a pale gray solution, was sucked out into a bulb-headed tube, much as a housewife gets the turkey-drippings from under the bird for basting. The fluid was dribbled into a row of transparent jars with calibrated sides, some getting more, some getting less. Then a drop of liquid — a brown liquid for this one, a red for that one, and so on — was added to each. While Jerry gazed at the scene, fighting the headache that began to grow with the brightness of the lights over the operating table, the medic captured each jar and gave it a sharp, practiced shake.

And then the whole picture was clear to Jerry.

"Crystal-clear," he said, with bitter humor.

For that was the answer. The fur-faces were colloidal, the raccoon/pangolins were crystalloid. Whatever fluid lay within the bellies of the animals, it was a super-saturate, needing but the right chemical additive before coming out of its liquid state to form the right crystals.

In each jar, almost instantly after shaking, bright crystals had begun to form within the liquid. Within but a few moments, the jars were being uncapped and the medics, with neat little tongs, were lifting the crystals from the solutions and placing them within the abdominal cavity of their anesthetized patient. The flap was fastened down into place with a gadget that seemed to work on the principle of a soldering iron. As it slid along the angled edges of the incision the sides met and fused, leaving only a tiny ridge to attest to the fact of the operation.

One of the medics nodded to the bare-to-the-waist creature still standing by. The man shoved over a wheeled cart, slipped the patient onto it and wheeled him out of the room through an archway barely within Jerry's field of vision.

Jerry's main concern, however, was for the fate of the crystalloid creature, lying so still upon the table. One of the medics undid the straps across the body, lifted it by a hind leg and shoved it

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through a hinged metal flap against the wall, then stabbed a button . . .

A red flare went off beyond the still oscillating metal flap, and Jerry had all the information he needed. A nice little incinerator, for hollowed-out corpses.

"I wonder," Jerry thought dismally, "how long my forty minutes will take in *this* Contact!" His headache was growing worse, and it wasn't just from the lights.

At that moment, a sudden lurch sent him crashing against the wall of the cage. A clamor of alarm bells began throughout the vessel.

One of the medics yelled something, and threw a switch against the wall opposite that housing the anesthetizing machine. A panel slid away, revealing a large mosaic of close-packed little spheroids. As the medic twisted a dial at the base of this arrangement, some of the spheroids began to flicker whitely, while others remained dark.

Then Jerry recognized it for what it was. A form of television screen, composed of individual lights instead of phosphorescing dots activated by magnetically guided electrons from a cathode. The effect was the same.

A picture, sharply etched by the alternation and varying intensities of the bulbs, appeared on the mosaic-screen. Across the dream-like surging of the black-gray-and-white heavy seas in the foreground, Jerry made out an armada of strange-looking vessels coming across the ocean toward wherever the pickup camera lay. Unlike Earth-vessels, they tapered *inward* as the sides of the vessels rose from the waters, then were abruptly truncated near what would have been a peak by a railinged area that was the deck.

"Unless I'm much mistaken," thought Jerry, grimly, "I am on a ship which — be it alone or one of many in a convoy — is about to be attacked by those vessels out there."

A SECOND later he knew he was right.

From the approaching fleet there had come no sign of armament, no flash or flame or belch of smoke or blaze of ray, but the room he was in jolted violently, then canted crazily for a sick moment before righting itself. The alarm bells grew louder in their metallic clangor.

Footsteps pounded down the corridor. The bare-to-the-waist man or another like him — Jerry could not distinguish between the creatures — came into the

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room shouting something. The surgeons shouted back and then the man raced out again.

Another jolt made the room tremble, but this time it felt different, as though the room were built to take that sort of stress. Jerry recognized that his ship was in the process of firing back, with whatever strange weapons these fur-faces employed. Even as he reasoned this out, one of the enemy vessels on the screen shuddered, split into almost-matching halves and plunged beneath the waves amid much flame and confusion.

The medics were not watching. One of them had moved out of Jerry's view and now stepped back into it, carrying the wriggling form of one of the animals from the cages. As Jerry watched, the animal, its orange teeth snapping vainly at those hard black fingertips on the medic's white-furred hands, was lashed to the table in the gray-smeared spot where its predecessor had perished. Then the bare-chested man was coming back into the room, wheeling a man on a cart. This one was missing fur from an arm and part of the chest area. Jerry was able to confirm his earlier theory that the hollowness of the creatures was extended throughout the flexible green body-sheaths.

"Sonics," thought Jerry, all at once. "They're using sonic rays on each other. A good dose of heavy infravibration could *ruin* a collodial creature! The loss of the fur through subsonic friction is only a side-effect. The main damage is the breakdown of those colloid organs when the beam focuses on a man."

That would explain the way the other ship had simply sundered. Artificially induced metal-fatigue, by the application of controlled vibration.

"Damn," thought Jerry, "this is *dangerous!*"

Other alien vessels were visible now on that granulated "screen," heading *away* from the camera. At least Jerry's ship was not alone in the face of that armada. His ship was one of at least a dozen — with more, possibly, outside the pickup range of the camera — involved on his side of the battle. Some of them shattered silently apart and boiled into the churning waters with a violence so great that Jerry could "feel" the sound with his eyes.

Apparently the medics, while anxious about the course of the fray, did not want their surgical endeavors bothered with the actual noise of the battle. Or perhaps the technology which had evolved this type of TV screen had never stumbled upon the familiar-to-Earth methods of

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transmitting sound by electromagnetic radiation.

"HOW long can forty minutes *last?*" Jerry wondered in growing concern. By his own time-sense, warped by the life-span of his host, he felt he'd been present in that room well over an hour. And still he was captive to the environment of the scaly crystalloid raccoon/pangolin creature, and doubly imperiled of survival. Even if "his" side took the lead in the struggle, many fur-faces would need this treatment — which destroyed one of his species with each operation.

Jerry did not know whether or not the animals were chosen in any special order. But his mind told him that even were his host the last so chosen, his odds for survival were dwindling fast.

Assuming the wall against which his cage was stacked with the others were the same size as the wall opposite his cage — and symmetrical construction of rooms seemed a strong likelihood — then, judging by his cage-size, the maximum number of cages that could be so stacked was six high and four across, or twenty-four cages. Figuring one animal per cage, that left some twenty-one animals ahead of him.

Possibly — barely possibly — this tier of cages might *not* be against a wall. It might be the forefront of hundreds of rows of similar stacked cages. But no medic hurrying to save a life would walk to Row #2 when Row #1 was still undepleted.

"So if I just sit here," he thought, gloomily, "I'm bound to end up alongside a fur-face on that table. My life gone so that his may survive. 'It is a far, far better thing I do' and so on, but I don't know as I'm ready to lay down my life for a fur-face without even being given the *choice,* damn it! Let's figure a way *out* of this mess!"

The ship went *whooomp,* suddenly. The room gave a crazy tilt again before — rather sluggishly, Jerry noted with alarm — righting itself. At the same moment the TV screen blanked out.

"Well, there goes the camera," he thought, his insides feeling oddly cold and upset. "That may mean that if I don't die on the operating table, I may well be forced to succumb to a watery grave. Damn! *When* will those forty minutes be *up*?"

He was jerked from his thoughts by the appearance of a huge white-furred hand fumbling with the catch on his cage.

Hard, pointed black fingertips reached in through the opened

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door for him. Jerry snapped and clacked his teeth upon them in vain, as he was carried toward the strap-sided concavity beside a new fur-scorched patient on the operating table.

"Use your head!" he screamed at himself. "These fur-faces aren't expecting an *intelligent* attack from a lab-animal! The other crystalloid creatures have the paltry instinctive self-preservation mechanism to bite at the objects gripping them, those impervious black fingertips. But you know better, right?"

And with that thought, Jerry tilted his head just a bit further forward, and let his orange fangs crackle through the thin chitinous green "flesh" beneath the stiff white fur on the alien's wrist...

YELLOW dispersion-medium spurted with a satisfactory gush from the scalloped gap in the alien's forearm.

Jerry landed nimbly on his hind feet on the metal floor as the shrieking medic dashed to a confrere for whatever first aid is given when a colloidal creature's liquid contents are spilling out.

While a minor part of his mind wondered idly if they'd employ a tourniquet or just a cork, the rest of his mind concentrated on directing those fore-paw-and-foot phalanges to carry him swiftly up the face of the stacked cages. There were twenty-four of them, all right, against the wall. He perched precariously on the top, in the cage-roof-to-ceiling space that was too small for another layer of the same.

As the fur-face medic fiddled around with the wrist of the man Jerry had bitten (it was the raccoon/pangolin medic, of course), the anesthetist dragged a small stool over to the base of the stacked cages and began climbing up after him.

"Oh, hell," thought Jerry, cowering weakly against the wall. "If I had a piece of chalk or a charcoal stick I could write something. Or draw a picture, maybe, on the ceiling. Then they'd know I was intelligent, and — They'd probably use me anyhow. The middle of a battle is no time for writing learned scientific papers about new zoological 'finds.'"

Those black fingertips were coming for him, too carefully for a repeat wrist-crunching performance. If he were taken this time the bearer would handle with care.

Jerry skittered and scrabbled for the corner near the wall, hoping to engage the anesthetist in a game of you-climb-up-at-*this*-point-and-I-run-back-to-*that*-point. But the fur-face had too

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long a reach to make it practical. As Jerry cowered helplessly, those black fingertips gripped him about the throat with strangling force. It apparently made no difference if he died on the top of the cages or under the scalpel. He could only fend feebly with his paws at the creature as he was lifted down to the table and set into the concavity, dizzy and sick.

"White lightning?" he begged. "Come on, white lightning! Please, test, be over. How long can forty minutes *last?*"

Then the room gave a horrible shudder and all the lights went out.

Jerry, not yet strapped in place, heard the cries of the medics, and then the terrifying sound of rushing seas in the invisible corridor as the room canted swiftly onto its side. This time it did not right itself. A thick, falling-elevator feeling bunched up inside Jerry. He knew that the warship was plunging beneath the heaving surge outside.

He scrambled about on the floor — no, it was the wall now — almost brained by the crashing bulk of the operating table. He kept jumping futilely upward, hoping somehow to escape to the corridor and get outside the ship before all that water got inside this room.

Then icy tons of fluid crashed down upon him, flattening him against the wall beneath his feet. The cries of the medics were suddenly gurgles, then a brief, faintly heard sound of bubbling.

Jerry, trying to swim against the swirling pressures of the flood that now lifted him from against the wall and spun him end over end, could hold his breath no longer.

In despair, he felt his jaws widen and take in the chill liquid in which he was whirled.

It went in without gagging him, and did not come out. Not through his mouth, at any rate. It came out through long slots just in front of those auricular vents in his head.

Gills! Jerry was an amphibian.

Webbing, hitherto folded away, appeared on his feet. "I'll be damned," he sighed, with weary relief.

Then he paddled determinedly about in the utter blackness until he found a cage lying on its side, the door sprung open. Jerry got inside, closed the door until it caught as well as its broken catch would allow and settled himself for a nice wait.

"At least I won't have to worry about getting gobbled by a natural underwater enemy," he figured.

He had to wait another sub-

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jective hour before the silent flash of white lightning lifted him out of his third, and last, Contact on Arcturus Beta.

VII

"ALL right, sir?" asked Peters, removing the bulky helmet with care.

Jerry sat up and nodded, blinking his eyes as he adjusted to his body once more. He was hard-pressed not to start testing his own joints and lungs and limbs for knowledge, and had to forcibly remind himself that this frail shell was his "normal" body.

Now to await the technician's analysis of the data.

Jerry, waving off Peters' hand, outstretched in automatic offer of assistance, sat up wearily on the edge of the couch. After a deep breath he got to his feet. Within the ship, the data-analyzer clattered busily.

"Some hot coffee, sir?" asked Peters, helpfully.

Jerry was annoyed at the effort it cost him just to talk. "That will go nicely, Captain," he managed.

The technician leaned out the airlock door, his homely face split in a grin. "No problem with the aliens, sir," he said to Peters. "Amiability indeterminate, but their basic weapon is infrasonics. They're built like hard bubbles, sure suckers for bayonets or bullets. I don't think, with sonic-shields, we'll have much trouble with them."

Peters, in the process of pouring Jerry's coffee, shrugged. "Well, we're not here to *make* trouble, either. The roborocket reported that the aliens live either at sea or at least always in coastal regions. They shouldn't object to our starting a settlement this far inland."

"And," said Jerry, suddenly, as he took the coffee and sipped at the hot brown liquid, "I suppose those worm-creatures and the horned lions are to be eliminated?"

The technician dropped his eyes. "We can't have new colonists getting pulled into those burrows, or impaled on those horns, sir." He handed the report, translated by the machine into readable English, to Peters. The pilot scanned the sheets, and nodded.

"Seems easy enough," he said agreeably. "Those jellyfish-things, and the flying apes are similar to species encountered before. They'll respond to simple gunfire. Removal of the worm-things will be automatic, once their source of sustenance is destroyed."

Jerry continued to sip his coffee and made no comment.

"As for the lion-things," Peters continued, "I doubt we'll

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have to attack them directly, since their digestive mechanism calls for sulphur from those pits. When we cap off the pits, or dry them up, to clear the air for the incoming colonial wave, that should starve them out within a week."

"Less than that," Jerry remarked emotionlessly. "Being hungry they'll eat, regardless. Then, unable to go on to the next step in the process — the ingestion of the sulphur — they'll die of food-poisoning. Simple, neat and efficient."

Peters smiled and gripped Jerry's hand with his own.

"We have you to thank for the information, sir," he said, in obvious admiration. "At least we know we won't have to fight the intelligent aliens. We'll have the central regions; they'll have the coasts and seas."

"And—" Jerry pointedly withdrew his strong fingers from the pilot's hand — "what happens when Mankind decides to spread out? When the colony grows awhile, it's bound to want some of the coastal regions. Then what?"

PETERS looked uncomfortable, then said, "I don't think that's likely to happen, sir. Not for some time, at any rate."

"But it *will* happen," said Jerry, somberly. "It always happens. Earthmen meet new races, arbitrate a hit, sign pacts and move in. Then, when they're settled pretty well, they ask the other race to move out. It's almost a truism, Captain, that Earth can't comprehend anyone but an Earthman having any rights to survival."

The tight-lipped technician exchanged a look with Peters, then ducked back inside the ship. Adverse commentary about a Space Zoologist was dangerous. But no one had yet been broken in rank or discharged for a facial expression.

"Well, sir, you're entitled to your opinion, of course," said Peters, wishing he had the moral courage to duck inside after the technician and avoid conversing with Norcriss. The job was done; why not forget it?

Jerry, sensing the other man's discomfort, dropped the topic, and contented himself with sitting there in the increasing darkness, sipping his coffee. After a minute or two, Peters gratefully mumbled his excuses and went into the ship.

Jerry sighed, finished his coffee, then began to walk toward the edge of the clearing, to watch the stars glow more brightly than they could in the interference of the ship's lights illuminating the camp.

When he reached the rim of

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the wooded area, he stopped, then lay on his back in the cool grass and watched the night sky, his thoughts rueful ones and his inner amusement ironic.

People always were puzzled about how a Space Zoologist could stand being a creature other than a human being. And Space Zoologists always were puzzled about how a human being could stand being part of that conquering race called man.

The twinkling stars distracted Jerry. Lying there watching them, he wondered to which of their planets he would be sent next, and to what dangers he might — in his new bodies — be subjected.

Neither he nor any of his fellow zoologists had any real apprehensions about death in an alien body. Fear of death, yes. That was normal enough, and inescapable in any creature. But he had no fear of perishing as a crawling thing, or multilegged thing, or soaring winged thing.

To Jerry Norcriss — indeed, to any Space Zoologist — to die like a man was a dubious honor at best.

— JACK SHARKEY

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They lived in spaceborne bubbles and feared the Earth — but not as much as old Earth feared them!

BY FRITZ LEIBER

THE CLUSTER

Illustrated by DICK FRANCIS

WHEN the eviction order arrived, Fats Jordan was hanging in the center of the Big Glass Balloon, hugging his guitar to his massive black belly above his purple shorts.

The Big Igloo, as the large living-Globe was more often called, was not really made of glass. It was sealingsilk, a cheap flexible material almost as transparent as fused silica and ten thousand

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times tougher — quite tough enough to hold a breathable pressure of air in the hard vacuum of space.

Beyond the spherical wall loomed the other and somewhat smaller balloons of the Beat Cluster, connected to each other and to the Big Igloo by three-foot-diameter cylindrical tunnels of triple-strength tinted sealingsilk. In them floated or swam about an assemblage of persons of both sexes in informal dress and undress and engaged in activities suitable to freefall: sleeping, sunbathing, algae tending ("rocking" spongy cradles of water, fertilizer and the green scummy "guk"), yeast culture (a rather similar business), reading, studying, arguing, stargazing, meditation, space-squash (played inside the globular court of a stripped balloon), dancing, artistic creation in numerous media and the production of sweet sound (few musical instruments except the piano depend in any way on gravity).

Attached to the Beat Cluster by two somewhat larger sealingsilk tunnels and blocking off a good eighth of the inky, star-speckled sky, was the vast trim aluminum bulk of Research Satellite One, dazzling now in the untempered sunlight.

It was mostly this sunlight reflected by the parent satellite, however, that now illuminated Fats Jordan and the other "floaters" of the Beat Cluster. A huge sun-quilt was untidily spread (staying approximately where it was put, like all objects in freefall) against most of the inside of the Big Igloo away from the satellite. The sun-quilt was a patchwork of colors and materials on the inward side, but silvered on the outward side, as turned-over edges and corners showed. Similar "Hollywood Blankets" protected the other igloos from the undesirable heating effects of too much sunlight and, of course, blocked off the sun's disk from view.

Fats, acting as Big Daddy of the Space Beats, received the eviction order with thoughtful sadness.

"So we all of us gotta go down *there*?"

HE jerked a thumb at the Earth, which looked about as big as a basketball held at arms-length, poised midway between the different silvers of the sun-quilt margin and the satellite. Dirty old Terra was in half phase: wavery blues and browns toward the sun, black away from it except for the tiny nebulous glows of a few big cities.

"That is correct," the proctor of the new Resident Civilian Administrator replied through thin lips. The new proctor was a lean

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man in silvery gray blouse, Bermuda shorts and sockassins. His hair was precision clipped — a quarter-inch blond lawn. He looked almost unbearably neat and hygienic contrasted with the sloppy long-haired floaters around him. He almost added, "and high time, too," but he remembered that the Administrator had enjoined him to be tactful—"firm, but tactful." He did not take this suggestion as including his nose, which had been wrinkled ever since he had entered the igloos. It was all he could do not to hold it shut with his fingers. Between the overcrowding and the loathsome Chinese gardening, the Beat Cluster *stank*.

And it was dirty. Even the satellite's precipitrons, working over the air withdrawn from the Beat Cluster via the exhaust tunnel, couldn't keep pace with the new dust. Here and there a film of dirt on the sealingsilk blurred the starfields. And once the proctor thought he saw the film *crawl*.

Furthermore, at the moment Fats Jordan was upside-down to the proctor, which added to the latter's sense of the unfitness of things. Really, he thought, these beat types were the curse of space. The sooner they were out of it the better.

"Man," Fats said mournfully, "I never thought they were going to enforce those old orders."

"The new Administrator has made it his first official act," the proctor said, smiling leanly. He went on, "The supply rocket was due to make the down-jump empty this morning, but the Administrator is holding it. There is room for fifty of your people. We will expect that first contingent at the boarding tube an hour before nightfall."

Fats shook his head mournfully and said, "Gonna be a pang, leavin' space."

His remark was taken up and echoed by various individuals spotted about in the Big Igloo.

"IT'S going to be a dark time," said Knave Grayson, merchant spaceman and sun-worshipper. Red beard and sheathknife at his belt made him look like a pirate. "Do you realize the nights average twelve hours down there instead of two? And there are days when you never see Sol?"

"Gravity yoga will be a trial after freefall yoga," Guru Ishpingham opined, shifting from padmasana to a position that put his knees behind his ears in a fashion that made the proctor look away. The tall, though presently much folded and intertwined, Briton was as thin as Fats Jordan was stout. (In space the number of thins and fats tends to increase sharply, as neither overweight nor under-musculature carries the

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penalties it does on the surface of a planet.)

"And mobiles will be trivial after space stabiles," Erica Janes threw under her shoulder. The husky sculptress had just put the finishing touches to one of her three-dimensional free montages —an arrangement of gold, blue and red balls—and was snapping a stereophoto of it. "What really hurts," she added, "is that our kids will have to try to comprehend Newton's Three Laws of Motion in an environment limited by a gravity field. Elementary physics should never be taught anywhere except in freefall."

"No more space diving, no more water sculpture, no more vacuum chemistry," chanted the Brain, fourteen-year-old fugitive from a brilliant but much broken home down below.

"No more space pong, no more space pool," chimed in the Brainess, his sister. (Space pool, and likewise billiards, is played on the inner surface of a stripped balloon. The balls, when properly cued, follow it by reason of their slight centrifugal force.)

"Ah well, we all knew this bubble would someday burst," Gussy Friml summed up, pinwheeling lazily in her black leotards. (There is something particularly beautiful about girls in space, where gravity doesn't tug at their curves. Even fat folk don't sag in freefall. Luscious curves become truly remarkable.)

"*Yes!*" Knave Grayson agreed savagely. He'd seemed lost in brooding since his first remarks. Now as if he'd abruptly reached conclusions, he whipped out his knife and drove it through the taut sealingsilk at his elbow.

The proctor knew he shouldn't have winced so convulsively. There was only the briefest whistle of escaping air before the edge-tension in the sealingsilk closed the hole with an audible *snap*.

KNAVE smiled wickedly at the proctor. "Just testing," he explained. "I knew a roustabout who lost a foot stepping through sealingsilk. Edge-tension cut it off clean at the ankle. The foot's still orbiting around the satellite, in a brown boot with needle-sharp hobnails. This is one spot where a boy's got to remember not to put his finger in the dike."

At that moment Fats Jordan, who'd seemed lost in brooding too, struck a chilling but authoritative chord on his guitar.

"Gonna be a *pang*
"Leavin' space," (he sang)
"Gonna be a *pang!*"

The proctor couldn't help wincing again. "That's all very well," he said sharply, "and I'm glad you're taking this realistically.

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But hadn't you better be getting a move on?"

Fats Jordan paused with his hand above the strings. "How do you mean, Mister Proctor?" he asked.

"I mean getting your first fifty ready for the down jump!"

"Oh, *that,*" Fats said and paused reflectively. "Well, now, Mr. Proctor, *that's* going to take a little time."

The proctor snorted. "Two hours!" he said sharply and, grabbing at the nylon line he'd had the foresight to trail into the Beat Cluster behind him (rather like Theseus venturing into the Minotaur's probably equally smelly labyrinth), he swiftly made his way out of the Big Igloo, hand over hand, by way of the green tunnel.

The Brainess giggled. Fats frowned at her solemnly. The giggling was cut off. To cover her embarrassment the Brainess began to hum the tune to one of her semi-private songs:

"Eskimos of space are we
"In our igloos falling free.
"We are space's Esquimaux,
"Fearless vacuum-chewing
hawks."

Fats tossed Gussy his guitar, which set him spinning very slowly. As he rotated, precessing a little, he ticked off points to his comrades on his stubby, ripe-banana-clustered fingers.

"Somebody gonna have to tell the research boys we're callin' off the art show an' the ballet an' terminatin' jazz Fridays. Likewise the Great Books course an' Saturday poker. Might as well inform our friends of Edison and Convair at the same time that they're gonna have to hold the 3D chess and 3D go tournaments at their place, unless they can get the new Administrator to donate them our quarters when we leave — which I doubt. I imagine he'll tote the Cluster off a ways and use the igloos for target practice. With the self-sealin' they should hold shape a long time.

"But don't exactly tell the research boys when we're goin' or why. Play it mysterioso.

"Meanwhile the gals gotta start sewin' us some ground clothes. Warm *and* decent. And we all gotta get our papers ready for the customs men, though I'm afraid most of us ain't kept nothin' but Davis passports. Heck, some of you are probably here on Nansen passports.

"An' we better pool our credits to buy wheelchairs and dollies groundside for such of us as are gonna need 'em." Fats looked back and forth dolefully from Guru Ishpingham's interwoven emaciation to his own hyper-portliness.

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MEANWHILE a space-diver had approached the Big Igloo from the direction of the satellite, entered the folds of a limp blister, zipped it shut behind him and unzipped the slit leading inside. The blister filled with a dull *pop* and the diver pushed inside through the lips. With a sharp effort he zipped them shut behind him, then threw back his helmet.

"Condition Red!" he cried. "The new Administrator's planning to ship us all groundside! I got it straight from the Police Chief. The new A's taking those old deportation orders seriously and he's holding the —"

"We know all about that, Trace Davis," Fats interrupted him. "The new A's proctor's been here."

"Well, what are you going to *do* about it?" the other demanded.

"Nothin'," Fats serenely informed the flushed and shock-headed diver. "We're complyin'. You, Trace —" he pointed a finger — "get out of that suit. We're auctionin' it off 'long with all the rest of our unworldly goods. The research boys'll be eager to bid on it. For fun-diving our spacesuits are the pinnacle."

A carrot-topped head thrust out of the blue tunnel. "Hey, Fats, we're broadcasting," its freckled owner called accusingly. "You're on in thirty seconds!"

"Baby, I clean forgot," Fats said. He sighed and shrugged. "Guess I gotta tell our downside fans the inglorious news. Remember all my special instructions, chillun. Share 'em out among you." He grabbed Gussy Friml's black ankle as it swung past him and shoved off on it, coasting toward the blue tunnel at about one fifth the velocity with which Gussy receded from him in the opposite direction.

"Hey, Fats," Gussy called to him as she bounced gently off the sun-quilt, "you got any general message for us?"

"Yeah," Fats replied, still rotating as he coasted and smiling as he rotated. "Make more guk, chillun. Yeah," he repeated as he disappeared into the blue tunnel, "take off the growth checks an' make mo' guk."

SEVEN seconds later he was floating beside the spherical mike of the Beat Cluster's short-wave station. The bright instruments and heads of the Small Jazz Ensemble were all clustered in, sounding a last chord, while their foreshortened feet waved around the periphery. The half dozen of them, counting Fats, were like friendly fish nosing up to the single black olive of the mike. Fats had his eyes on the Earth, a little more than half night now and about as big as

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the snare drum standing out from the percussion rack Jordy had his legs scissored around. It was good, Fats thought, to see who you were talking to.

"Greetings, groundsiders," he said softly when the last echo had come back from the sealing-silk and died in the sun-quilt. "This is that ever-hateful voice from outer space, the voice of your old tormentor Fats Jordan, advertising no pickle juice." Fats actually said "advertising," not "advertisin' "—his diction always improved when he was on vacuum.

"And for a change, folks, I'm going to take this space to tell you something about us. No jokes this time, just tedious talk. I got a reason, a real serious reason, but I ain't saying what it is for a minute."

He continued, "You look mighty cozy down there, mighty cozy from where we're floating. Because we're way out here, you know. Out of this world, to quote the man. A good twenty thousand miles out, Captain Nemo.

"Or we're up here, if it sounds better to you that way. Way over your head. Up here with the stars and the flaming sun and the hot-cold vacuum, orbiting around Earth in our crazy balloons that look like a cluster of dingy glass grapes."

The band had begun to blow softly again, weaving a cool background to Fat's lazy phrases.

"Yes, the boys and girls are in space now, groundsiders. We've found the cheap way here, the back door. The wild ones who yesterday would have headed for the Village or the Quarter or Big Sur, the Left Bank or North Beach, or just packed up their Zen Buddhism and hit the road, are out here now, digging cool sounds as they fall round and round Dear Old Dirty. And folks, ain't you just a little glad we're gone?"

THE band coasted into a phrase that was like the lazy swing of a hammock.

"Our cold-water flats have climbed. Our lofts have gone aloft. We've cut our pads loose from the cities and floated them above the stratosphere. It was a stiff drag for our motorcycles, Dad, but we made it. And ain't you a mite delighted to be rid of us? I know we're not all up here. But the worst of us are.

"You know, people once pictured the conquest of space entirely in terms of military outposts and machine precision." Here Burr's trumpet blew a crooked little battle cry. "They didn't leave any room in their pictures for the drifters and dreamers, the rebels and no-goods (like me, folks!) who are up here

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right now, orbiting with a few pounds of oxygen and a couple of gobs of guk (and a few cockroaches, sure, and maybe even a few mice, though we keep a cat) inside a cluster of smelly old balloons.

"That's a laugh in itself: the antique vehicle that first took man off the ground also being the first to give him cheap living quarters outside the atmosphere. Primitive balloons floated free in the grip of the wind; we fall free in the clutch of gravity. A balloon's a symbol, you know, folks. A symbol of dreams and hopes and easily-punctured illusions. Because a balloon's a kind of bubble. But bubbles can be tough."

Led by Jordy's drums, the band worked into the Blue Ox theme from the Paul Bunyan Suite.

"Tough the same way the hemlock tents and sod huts of the American settlers were tough. We got out into space, a lot of us did, the same way the Irish and Finns got west. They built the long railroads. We built the big satellites."

Here the band shifted to the Axe theme.

"I was a welder myself. I came into space with a bunch of other galoots to help stitch together Research Satellite One. I didn't like the barracks they put us in, so I made myself a little private home of sealingsilk, a material which was used only for sto

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liquids and gases—nobody'd even thought of it for human habitation. I started to meditate there in my bubble and I came to grips with a few half-ultimates and I got to like it real well in space. Same thing happened to a few of the other galoots. You know, folks, a guy who's wacky enough to wrestle sheet aluminum in vacuum in a spider suit may very well be wacky enough to get to really like stars and weightlessness and all the rest of it.

"When the construction job was done and the big research outfits moved in, we balloon men stayed on. It took some wangling but we managed. We weren't costing the Government much. And it was mighty convenient for them to have us around for odd jobs.

"THAT was the nucleus of our squatter cluster. The space roustabouts and roughnecks came first. The artists and oddballs, who have a different kind of toughness, followed. They got wind of what our life was like and they bought, bummed or conned their way up here. Some got space research jobs and shifted over to us at the ends of their stints. Others came up on awards trips and managed to get lost from their parties and accidentally find us. They brought their tapes and instruments with them, their sketchbooks and typers; some even smuggled up their own balloons. Most of them learned to do some sort of space work — it's good insurance on staying aloft. But don't get me wrong. We're none of us work-crazy. Actually we're the laziest cats in the cosmos: the ones who couldn't bear the thought of carrying their own weight around every day of their lives! We mostly only toil when we have to have money for extras or when there's a job that's just got to be done. We're the dreamers and funsters, the singers and studiers. We leave the 'to the stars by hard ways' business to our friends the space marines. When we use the 'ad astra per aspera' motto (was it your high school's too?) we change the last word to asparagus — maybe partly to honor the green guk we grow to get us oxygen (so we won't be chiseling too much gas from the Government) and to commemorate the food-yeasts and the other stuff we grow from our garbage.

"What sort of life do we have up here? How can we stand it cooped up in a lot of stinking balloons? Man, we're *free* out here, really free for the first time. We're floating, literally. Gravity can't bow our backs or break our arches or tame our ideas. You know, it's only out here that stupid people like us can really think. The weightlessness gets our thoughts and we can sort them.

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Ideas grow out here like nowhere else — it's the right environment for them.

"Anybody can get into space if he wants to hard enough. The ticket is a dream.

"That's our story, folks. We took the space road because it was the only frontier left. We had to come out, just because space was here, like the man who climbed the mountain, like the first man who skin-dove into the green deeps. Like the first man who envied a bird or a shooting star."

The music had softly soared with Fat's words. Now it died with them and when he spoke again it was without accompaniment, just a flat lonely voice.

"But that isn't quite the end of the story, folks. I told you I had something serious to impart — serious to us anyway. It looks like we're not going to be able to stay in space, folks. We've been told to get out. Because we're the wrong sort of people. Because we don't have the legal right to stay here, only the right that's conveyed by a dream.

"Maybe there's real justice in it. Maybe we've sat too long in the starbird seat. Maybe the beat generation doesn't belong in space. Maybe space belongs to soldiers and the civil service, with a slice of it for the research boys. Maybe there's somebody who wants to be in space more than we do. Maybe we deserve our comedownance. I wouldn't know.

"So get ready for a jolt, folks. We're coming back! If you *don't* want to see us, or if you think we ought to be kept safely cooped up here for any reason, you just might let the President know.

"This is the Beat Cluster, folks, signing off."

AS FATS and the band pushed away from each other, Fats saw that the little local audience in the sending balloon had grown and that not all new arrivals were fellow floaters.

"Fats, what's this nonsense about you people privatizing your activities and excluding research personnel?" a grizzle-haired stringbean demanded. "You can't cut off recreation that way. I depend on the Cluster to keep my electron bugs happily abnormal. We even mention it downside in recruiting personnel—though we don't put it in print."

"I'm sorry, Mr. Thoms," Fats said. "No offense meant to you or to General Electric. But I got no time to explain. Ask somebody else."

"Whatdya mean, no offense?" the other demanded, grabbing at the purple shorts. "What are you trying to do, segregate the squares in space? What's wrong

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with research? Aren't we good enough for you?"

"Yes," put in Rumpleman of Convair, "and while you're doing that would you kindly throw some light on this directive we just received from the new A—that the Cluster's off-bounds to us and that all dating between research personnel and Cluster girls must stop? Did *you* put the new A up to that, Fats?"

"Not exactly," Fats said. "Look, boys, let up on me. I got work to do."

"Work!" Rumpleman snorted.

"Don't think you're going to get away with it," Thoms warned Fats. "We're going to protest. Why, the Old Man is frantic about the 3D chess tournament. He says the Brain's the only real competition he has up here." (The Old Man was Hubert Willis, guiding genius of the open bevatron on the other side of the satellite.)

"The other research outfits are kicking up a fuss too," Trace Davis put in. "We spread the news like you said, and they say we can't walk out on them this way."

"Allied Microbiotics," Gussy Friml said, "wants to know who's going to take over the experiments on unshielded guk societies in freefall that we've been running for them in the Cluster."

Two of the newcomers had slightly more confidential messages for Fats.

Allison of Convair said, "I wouldn't tell you, except I think you've guessed, that I've been using the Beat Cluster as a pilot study in the psychology of anarchic human societies in freefall. If you cut yourself off from us, I'm in a hole."

"It's mighty friendly of you to feel that way," Fats said, "but right now I got to rush."

SPACE Marines Sergeant Gombert, satellite police chief, drew Fats aside and said, "I don't know why you're giving research a false impression of what's happening, but they'll find out the truth soon enough and I suppose you have your own sweet insidious reasons. Meanwhile I'm here to tell you that I can't spare the men to police your exodus. As you know, you old corner-cutter, this place is run more like a national park than a military post, in spite of its theoretical high security status. I'm going to have to ask you to handle the show yourself, using your best judgment."

"We'll certainly work hard at it, Chief," Fats said. "Hey, everybody, get cracking!"

"Understand," Gombert continued, his expression very fierce, "I'm wholly on the side of officialdom. I'll be officially overjoyed to see the last of you floaters. It

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just so happens that at the moment I'm short-handed."

"I understand," Fats said softly, then bellowed, "On the jump, everybody!"

But at sunset the new A's proctor was again facing him, right-side-up this time, in the Big Igloo.

"Your first fifty were due at the boarding tube an hour ago," the proctor began ominously.

"That's right," Fats assured him. "It just turns out we're going to need a little more time."

"What's holding you up?"

"We're getting ready, Mr. Proctor," Fats said. "See how busy everybody is?"

A half dozen figures were rhythmically diving around the Big Igloo, folding the sun-quilt. The sun's disk had dipped behind the Earth and only its wild corona showed, pale hair streaming across the star-fields. The Earth had gone into its dark phase, except for the faint unbalanced halo of sunlight bent by the atmosphere and for the faint dot-dot-dot of glows that were the Los Angeles-Chicago-New York line. Soft yellow lights sprang up here and there in the Cluster as it prepared for its short night. The transparent balloons seemed to vanish, leaving a band of people camped among the stars.

The proctor said, "We know you've been getting some unofficial sympathy from research and even the MPs. Don't depend on it. The new Administrator can create special deputies to enforce the deportation orders."

"He certainly can," Fats agreed earnestly, "but he don't need to. We're going ahead with it all, Mr. Proctor, as fast as we're able. F'rinstance, our groundclothes ain't sewed yet. You wouldn't want us arriving downside half naked an' givin' the sat' a bad reputation. So just let us work an' don't joggle our elbow."

The proctor snorted. He said, "Let's not waste each other's time. You know, if you force us to do it, we can cut off your oxygen."

THERE was a moment's silence. Then from the side Trace Davis said loudly, "Listen to that! Listen to a man who'd solve the groundside housing problem by cutting off the water to the slums."

But Fats frowned at Trace and said quietly only, "If Mr. Proctor shut down on our air, he'd only be doing the satellite a disservice. Right now our algae are producing a shade more oxy than we burn. We've upped the guk production. If you don't believe me, Mr. Proctor, you can ask the atmosphere boys to check."

"Even if you do have enough oxygen," the proctor retorted,

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"you need our forced ventilation to keep your air moving. Lacking gravity convection, you'd suffocate in your own exhaled breath."

"We got our fans ready, battery driven," Fats told him.

"You've got no place to mount them, no rigid framework," the proctor objected.

"They'll mount on harnesses near each tunnel mouth," Fats said imperturbably. "Without gravity they'll climb away from the tunnel mouths and ride the taut harness. Besides, we're not above hand labor if it's necessary. We could use punkahs."

"Air's not the only problem," the proctor interjected. "We can cut off your food. You've been living on handouts."

"Right now," Fats said softly, "we're living half on yeasts grown from our own personal garbage. Living well, as you can see by a look at me. And if necessary we can do as much better than half as we have to. We're farmers, man."

"We can seal off the Cluster," the proctor snapped back, "and set you adrift. The orders allow it."

Fats replied, "Why not? It would make a very interesting day-to-day drama for the groundside public and for the food chemists—seeing just how long we can maintain a flourishing ecology."

The proctor grabbed at his nylon line. "I'm going to report your attitude to the new Administrator as hostile," he sputtered. "You'll hear from us again shortly."

"Give him our greetings when you do," Fats said. "We haven't had opportunity to offer them. And there's one other thing," he called after the proctor, "I notice you hold your nose mighty rigid in here. It's a waste of energy. If you'd just steel yourself and take three deep breaths you'd never notice our stink again."

THE proctor bumped into the tunnel side in his haste to be gone. Nobody laughed, which doubled the embarrassment. If they'd have laughed he could have cursed. Now he had to bottle up his indignation until he could discharge it in his report to the new Administrator.

But even this outlet was denied him.

"Don't tell me a word," the new Administrator snapped at his proctor as the latter zipped into the aluminum office. "The deportation is canceled. I'll tell you about it, but if you tell anybody else I'll down-jump *you*. In the last twenty minutes I've had messages direct from the Space Marshal and the President. We must not disturb the Beat Cluster because of public opinion and

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because, although they don't know it, they're a pilot experiment in the free migration of people into space." ("Where else, Joel," the President had said, "do you think we're going to get people to go willingly off the Earth and achieve a balanced existence, using their own waste products? Besides, they're a floating labor pool for the satellites. And Joel, do you realize Jordan's broadcast is getting as much attention as the Russian landings on Ganymede?") The new Administrator groaned softly and asked the Unseen, "Why don't they tell a new man these things before he makes a fool of himself?"

Back in the Beat Cluster, Fats struck the last chord of "Glow Little Glow Worm." Slowly the full moon rose over the satellite, dimming the soft yellow lights that seemed to float in free space. The immemorial white globe of Luna was a little bit bigger than when viewed from Earth and its surface markings were more sharply etched. The craters of Tycho and Copernicus stood out by reason of the bright ray systems shooting out from them and the little dark smudge of the Mare Crisium looked like a curled black kitten. Fats led those around him into a new song:

"Gonna be a *pang*
"Leavin' space,
"Gonna be a *pang!*
"Gonna be a *pang*
"Leavin' space,
"So we won't go!"

—FRITZ LEIBER

★ ★ ★ ★ ★

FORECAST

The big news for December is Poul Anderson, beginning a major science-fiction novel that we're proud to present, uncut, as a two-part serial: *The Day After Doomsday*. It's Anderson's latest, and not far from being his best ever — which, as every science-fiction reader well knows, is very good indeed.

But there's more. Three fine novelettes, including Algis Budrys with *Wall of Crystal, Eye of Night* and Margaret St. Clair with a classification-defying exercise in wit and whimsy, *An Old Fashioned Bird Christmas*. Plus Willy Ley . . . plus the usual lineup of shorts . . . plus (we hope; if the type will stretch to hold it) an unusual article. It's going to be a memorable issue, and that's a promise. Say, isn't this a good time to subscribe?

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GALAXY'S 5-★ SHELF

YURI GAGARIN proved yet again that there is no substitute for scientific knowhow, hence this column devoted entirely to Junior Education:

THE ASTRONAUTS by Martin Caidin. E. P. Dutton & Co., Inc.

The limited payloads of our rockets have necessitated the Mercury Project approach to our first spaceflight. Despite safeguards and fail-safe devices, our attempts are marginal.

Caidin's copiously illustrated book fills in the information gap about America's seven astronauts, the men who hold the key to our chances. They are so remarkably able that the results of the tests awed the medical and technical testers. "Some of them actually kept up with (the tests) and they aren't designed to be kept up with!"

SPACE VOLUNTEERS by Terence Kay. Harper & Brothers.

Behind each invention or achievement are countless hours of tedious preparation. Newton "stood on the shoulders of giants."

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Einstein theorized about data observed by others.

Our seven astronauts will go into space armed with equipment and knowledge garnered by hundreds of "space volunteers" like Col. Stapp of rocket sled fame; Capt. Simons of the 20-mile-high balloon flight and scores of anonymous test pilots, centrifuge riders, ejection seat testers, etc., etc.

Kay's informative book is about unsung men who make the headlines possible.

NINETY SECONDS TO SPACE by Jules Bergman. Hanover House.

The book, an extravagantly illustrated account of the X-15 and its predecessors, refers in title to the total powered flight time of the rocket craft. It is also the story of the men who fly in (and occasionally die in) these barrier-shattering flying laboratories. As an inspirational story of hard work, research, experimentation and pure bravery, this book is tough to beat.

COUNTDOWN by William Roy Shelton. Little, Brown & Co.

"The story of Cape Canaveral," reads the subtitle of this book which chronicles the growth of America's prime rocket-launch area from a snake's paradise to the most exciting piece of real-estate in the western hemisphere. It is also the life story of many rockets — accident-prone Vanguard, reliable Jupiter, Thor, Atlas, Titan, Polaris. The *Life* and *Time* author, witness to almost all of the shoots, has written a breezy, interest-sustaining story.

THE MAN WHO RODE THE THUNDER by W. H. Rankin. Prentice Hall, Inc.

Marine Lt. Col. Rankin made headlines when he bailed out of a supersonic jet ten miles up without a pressure suit and then descended through a thunderstorm. The return to earth took forty minutes instead of ten, but a frail human being survived the unbelievable violence of the thunder, lightning and deluge.

This thrilling true adventure makes one speculate upon what extremes of physical anguish the new breed of spacemen will have to endure.

POLARIS! by James Baar and William E. Howard. Harcourt, Brace & Co.

Firing a rocket 1200 miles from a submerged nuclear submarine to a pinpointed target seems a near-impossibility. So it is — but it only took the Navy 4½ years to accomplish the im-

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possible. Of prime importance was a shrewd decision to switch in midstream from the liquid fuel Army Jupiter missile to the solid fuel Polaris.

The authors present a segment of missile history that should serve as inspiration to all good damn-the-red-taper-ers.

THE FASCINATING WORLD OF ASTRONOMY by R. S. Richardson. McGraw Hill Book Co., Inc.

Dr. Richardson, formerly of Palomar and Mt. Wilson, employing the question-and-answer technique, poses questions that laymen ask most:

"What makes the sun shine?"

"What created the planets?"

"What is the farthest the eye can see?"

The good doctor has written an eminently readable and informative book.

THE BOOK OF THE ATOM by Leonard de Vries. The Macmillan Co.

Author de Vries's bated-breath treatment of his subject enhances its already enormous appeal. These chapter headings convey the tone: "A Horrible Suspicion;" "The Greatest Race of All Time;" "Leviathan in Chains;" "A Cracker Full of Surprises."

CAREERS AND OPPORTUNITIES IN SCIENCE by Philip Pollack. E. P. Dutton & Co., Inc.

The stupendous strides of technology have made necessary this revision of a 1945 career guide. Industries and products undreamt of 15 years ago have opened up job opportunities equally new. Pollack's fine book details opportunities each field offers, some background fill-in, necessary training and remunerative averages. One message comes in loud and clear — *advanced study, to and including Ph.D., pays off!*

SATURDAY SCIENCE edited by Andrew Bluemle. E. P. Dutton & Co.

Westinghouse sponsors the annual Science Talent Search. It also offers a program for all honor high school students in the Pittsburgh area, a series of lectures by members of the Westinghouse Research Labs which were adapted for this excellent, provocative book. The biographical vignettes heading each chapter should also serve as inspiration for aspiration and emulation.

FROM CELL TO TEST TUBE by R. W. Chambers and A. S. Payne. Chas. Scribner's Sons.

Biochemistry, the chemistry of living things, is a young science.

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Why? Because man had to get over the fever of discovery of the vast new world of micro-organisms before he could begin to ask for answers to: Why and how do the chemical compounds called Life react and reproduce?

The book is a fine combination of provocative subject and intelligent presentation.

THE ROMANCE OF WEIGHTS AND MEASURES by Keith Gordon Irwin. The Viking Press.

Irwin's special interest is the English system; its origins, changes and present complexity. He presents the beautiful simplicity of decimal-system measurement in Anglo-Saxon England a millenium ago and the succeeding chaos created by Norman conquest and foreign trade.

In his fascinating book, Irwin, like Asimov, proves that the subject of weights and measures can be as engrossing as any facet of human development.

THE LIFE AND TIMES OF TARQUIN THE ETRUSCAN by C. M. Franzero. The John Day Co., Inc.

That the Etruscans are a people of mystery is peculiar because Etruria, even more than Greece, is the cornerstone of Roman civilization. Rome took over intact the Etruscan system of government, army organization, civil engineering. The founder of the Tarquinian dynasty of Roman kings was Etruscan.

However, the infamous "Rape of Lucrece" touched off the destruction, in repugnance, by the Romans of every available Etruscan relic.

Franzero's minutely detailed book makes the utmost of myth and conjecture.

THE LOST PHARAOHS by Leonard Cottrell. Holt, Rinehart and Winston.

Archeology being scientific detection raised to the heights, it is hardly surprising that Cottrell's exciting book reads like a detective story. Instead of tracking down culprits, however, Egyptologists uncover cadavers buried for millenia. In one fantastic discovery, over *thirty* Pharaohs were found in a common tomb where they had been hastily reburied more than 3000 years ago to save them from the ravages of tomb robbers!

SEVEN MILES DOWN by Jacques Piccard and Robert S. Dietz. G. P. Putnam's Sons.

Auguste Piccard, inventor of the bathyscaph, wrote phlegmatically in *Earth, Sea and Sky* of

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his adventures in stratosphere and abyss. His son, Jacques, pilot on the deep dives undertaken by the bathyscaphs *FNRS-2* and *Trieste,* is much more demonstrative in his account, particularly of touchdown in the deepest hole on earth, 35,800 feet down in Challenger Deep. Adventure lies in Inner as well as Outer Space.

EDISON EXPERIMENTS YOU CAN DO. Harper & Bros.

Methodical Tom Edison made notes on every experiment he ever conducted. During his lifetime, he filled 3400 notebooks of 200 pages each!

In this fascinating book prepared by the Edison Foundation, the reader can follow the footsteps of the great man, in some cases from actual facsimiles of the original notes, and using simple materials.

SCIENCE PUZZLERS by Martin Gardner. The Viking Press.

First impression is that Gardner has written an ordinary book of stunts. However, each puzzler is just that; it makes the reader ponder even though no special experimental equipment is needed.

Chemistry, astronomy, topology, psychology, etc. are contributors to the mind-teasers.

THE WILD ROCKET by Peggy Hoffman. Westminster Press.

An indisputably fit subject for a science-fiction juvenile is the planning, building and firing of a home-made, six-foot, solid-propellant rocket by an untutored backwoods boy. These basic facts are mere background however, for Mrs. Hoffman's warm, tender story of the guts and sheer determination of the orphaned, loveless youth and the understanding he encounters.

Rating (12-15): ****½

DANNY DUNN ON THE OCEAN FLOOR by Jay Williams and Raymond Abrashkin. Whittlesey House.

Danny's adventures are always based on a solid science foundation, once the authors' usually wild main premise is digested. Currently Danny, in cooking a plastic mixture of Professor Bullfinch's, employer of Danny's widowed mother, achieves a transparent plastic of super-strength — but through the sheer neglect of his duties.

In short order, jovial Prof. Bullfinch, acidulous Dr. Grimes, Danny and friends Irene and Joe are off to explore the ocean bottom in a transparent, super-strength bathyscaphe.

Rating (8-12) ****½

— **FLOYD C. GALE**

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He was dangerously insane. He threatened to destroy everything that was noble and decent — including my date with my girl!

THE SPY IN THE ELEVATOR

By DONALD E. WESTLAKE
Illustrated by WEST

WHEN the elevator didn't come, that just made the day perfect. A broken egg yolk, a stuck zipper, a feedback in the aircon exhaust, the window sticking at full transparency — well, I won't go through the whole sorry list. Suffice it to say that when the elevator didn't come, that put the roof on the city, as they say.

It was just one of those days. Everybody gets them. Days when you're lucky in you make it to nightfall with no bones broken.

But of all times for it to happen! For literally months I'd been building my courage up. And finally, just today, I had made up my mind to do it — to propose to Linda. I'd called her second thing this morning — right after the egg yolk — and invited myself down to her place. "Ten o'clock," she'd said, smiling sweetly at me out of the phone. She knew why I wanted to talk to her. And

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when Linda said ten o'clock, she meant ten o'clock.

Don't get me wrong. I don't mean that Linda's a perfectionist or a harridan or anything like that. Far from it. But she does have a fixation on that one subject of punctuality. The result of her job, of course. She was an ore-sled dispatcher. Ore-sleds, being robots, were invariably punctual. If an ore-sled didn't return on time, no one waited for it. They simply knew that it had been captured by some other Project and had blown itself up.

Well, of course, after working as an ore-sled dispatcher for three years, Linda quite naturally was a bit obsessed. I remember one time, shortly after we'd started dating, when I arrived at her place five minutes late and found her having hysterics. She thought I'd been killed. She couldn't visualize anything less than that keeping me from arriving at the designated moment. When I told her what actually had happened — I'd broken a shoe lace — she refused to speak to me for four days.

And then the elevator didn't come.

UNTIL then, I'd managed somehow to keep the day's minor disasters from ruining my mood. Even while eating that horrible egg — I couldn't very well throw it away, broken yolk or no; it was my breakfast allotment and I was hungry — and while hurriedly jury-rigging drapery across that gaspingly transparent window — one hundred and fifty-three stories straight down to slag — I kept going over and over my prepared proposal speeches, trying to select the most effective one.

I had a Whimsical Approach: "Honey, I see there's a nice little Non-P apartment available up on one seventy-three." And I had a Romantic Approach: "Darling, I can't live without you at the moment. Temporarily, I'm madly in love with you. I want to share my life with you for a while. Will you be provisionally mine?" I even had a Straightforward Approach: "Linda, I'm going to be needing a wife for at least a year or two, and I can't think of anyone I would rather spend that time with than you."

Actually, though I wouldn't even have admitted this to Linda, much less to anyone else, I loved her in more than a Non-P way. But even if we both had been genetically desirable (neither of us were) I knew that Linda relished her freedom and independence too much to ever contract for any kind of marriage other than Non-P — Non-Permanent, No Progeny.

So I rehearsed my various ap-

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proaches, realizing that when the time came I would probably be so tongue-tied I'd be capable of no more than a blurted, "Will you marry me?" and I struggled with zippers and malfunctioning air-cons, and I managed somehow to leave the apartment at five minutes to ten.

Linda lived down on the hundred fortieth floor, thirteen stories away. It never took more than two or three minutes to get to her place, so I was giving myself plenty of time.

But then the elevator didn't come.

I pushed the button, waited, and nothing happened. I couldn't understand it.

The elevator had always arrived before, within thirty seconds of the button being pushed. This was a local stop, with an elevator that traveled between the hundred thirty-third floor and the hundred sixty-seventh floor, where it was possible to make connections for either the next local or for the express. So it couldn't be more than twenty stories away. And this was a non-rush hour.

I pushed the button again, and then I waited some more. I looked at my watch and it was three minutes to ten. Two minutes, and no elevator! If it didn't arrive this instant, this second, I would be late.

It didn't arrive.

I vacillated, not knowing what to do next. Stay, hoping the elevator would come after all? Or hurry back to the apartment and call Linda, to give her advance warning that I would be late?

Ten more seconds, and still no elevator. I chose the second alternative, raced back down the hall, and thumbed my way into my apartment. I dialed Linda's number, and the screen lit up with white letters on black: PRIVACY DISCONNECTION.

Of course! Linda expected me at any moment. And she knew what I wanted to say to her, so quite naturally she had disconnected the phone, to keep us from being interrupted.

Frantic, I dashed from the apartment again, back down the hall to the elevator, and leaned on that blasted button with all my weight. Even if the elevator should arrive right now, I would still be almost a minute late.

No matter. It didn't arrive.

I would have been in a howling rage anyway, but this impossibility piled on top of all the other annoyances and breakdowns of the day was just too much. I went into a frenzy, and kicked the elevator door three times before I realized I was hurting myself more than I was hurting the door. I limped back to the apartment, fuming, slammed the door

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behind me, grabbed the phone book and looked up the number of the Transit Staff. I dialed, prepared to register a complaint so loud they'd be able to hear me in sub-basement three.

I got some more letters that spelled: BUSY.

IT TOOK three tries before I got through to a hurried-looking female receptionist. "My name is Rice!" I bellowed. "Edmund Rice! I live on the hundred and fifty-third floor! I just rang for the elevator and —"

"The-elevator-is-disconnected." She said it very rapidly, as though she were growing very used to saying it.

It only stopped me for a second. "Disconnected? What do you mean disconnected? Elevators don't *get* disconnected!" I told her.

"We - will - resume - service - as - soon - as - possible," she rattled. My bellowing was bouncing off her like radiation off the Project force-screen.

I changed tactics. First I inhaled, making a production out of it, giving myself a chance to calm down a bit. And then I asked, as rationally as you could please, "Would you mind terribly telling me *why* the elevator is disconnected?"

"I-am-sorry-sir-but-that —"

"Stop," I said. I said it quietly, too, but she stopped. I saw her looking at me. She hadn't done that before, she'd merely gazed blankly at her screen and parroted her responses.

But now she was actually looking at *me*.

I took advantage of the fact. Calmly, rationally, I said to her, "I would like to tell you something, Miss. I would like to tell you just what you people have done to me by disconnecting the elevator. You have ruined my life."

She blinked, open-mouthed. "Ruined your life?"

"Precisely." I found it necessary to inhale again, even more slowly than before. "I was on my way," I explained, "to propose to a girl whom I dearly love. In every way but one, she is the perfect woman. Do you understand me?"

She nodded, wide-eyed. I had stumbled on a romantic, though I was too preoccupied to notice it at the time.

"In every way but one," I continued. "She has one small imperfection, a fixation about punctuality. And I was supposed to meet her at ten o'clock. *I'm late!*" I shook my fist at the screen. "Do you realize what you've *done*, disconnecting the elevator? Not only won't she marry me, she won't even *speak* to me! Not now! Not after this!"

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"Sir," she said tremulously, "please don't shout."

"I'm not shouting!"

"Sir, I'm terribly sorry. I understand your —"

"You *understand?*" I trembled with speechless fury.

She looked all about her, and then leaned closer to the screen, revealing a cleavage that I was too distraught at the moment to pay any attention to. "We're not supposed to give this information out, sir," she said, her voice low, "but I'm going to tell you, so you'll understand why we had to do it. I think it's perfectly awful that it had to ruin things for you this way. But the fact of the matter is —" she leaned even closer to the screen — "there's a spy in the elevator."

II

IT WAS my turn to be stunned. I just gaped at her. "A — a what?"

"A spy. He was discovered on the hundred forty-seventh floor, and managed to get into the elevator before the Army could catch him. He jammed it between floors. But the Army is doing everything it can think of to get him out."

"Well — but why should there be any problem about getting him out?"

"He plugged in the manual controls. We can't control the elevator from outside at all. And when anyone tries to get into the shaft, he aims the elevator at them."

That sounded impossible. "He *aims* the elevator?"

"He runs it up and down the shaft," she explained, "trying to crush anybody who goes after him."

"Oh," I said. "So it might take a while."

She leaned so close this time that even I, distracted as I was, could hardly help but take note of her cleavage. She whispered, "They're afraid they'll have to starve him out."

"Oh, no!"

She nodded solemnly. "I'm terribly sorry, sir," she said. Then she glanced to her right, suddenly straightened up again, and said, "We-will-resume-service-as-soon-as-possible." Click. Blank screen.

For a minute or two, all I could do was sit and absorb what I'd been told. A spy in the elevator! A spy who had managed to work his way all the way up to the hundred forty-seventh floor before being unmasked!

What in the world was the matter with the Army? If things were getting that lax, the Project was doomed, force-screen or no. Who knew how many more spies there were in the Project, still unsuspected?

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Until that moment, the state of siege in which we all lived had had no reality for me. The Project, after all, was self-sufficient and completely enclosed. No one ever left, no one ever entered. Under our roof, we were a nation, two hundred stories high. The ever-present threat of other projects had never been more for me — or for most other people either, I suspected — than occasional ore-sleds that didn't return, occasional spies shot down as they tried to sneak into the building, occasional spies of our own leaving the Project in tiny radiation-proof cars, hoping to get safely within another project and bring back news of any immediate threats and dangers that project might be planning for us. Most spies didn't return; most ore-sleds did. And within the Project life was full, the knowledge of external dangers merely lurking at the backs of our minds. After all, those external dangers had been no more than potential for decades, since what Dr. Kilbillie called the Ungentlemanly Gentleman's War.

Dr. Kilbillie — Intermediate Project History, when I was fifteen years old — had private names for every major war of the twentieth century. There was the Ignoble Nobleman's War, the Racial Non-Racial War, and the Ungentlemanly Gentleman's War, known to the textbooks of course as World Wars One, Two, and Three.

The rise of the Projects, according to Dr. Kilbillie, was the result of many many factors, but two of the most important were the population explosion and the Treaty of Oslo. The population explosion, of course, meant that there was continuously more and more people but never any more space. So that housing, in the historically short time of one century, made a complete transformation from horizontal expansion to vertical. Before 1900, the vast majority of human beings lived in tiny huts of from one to five stories. By 2000, *everybody* lived in Projects. From the very beginning, small attempts were made to make these Projects more than dwelling places. By mid-century, Projects (also called apartments and co-ops) already included restaurants, shopping centers, baby-sitting services, dry cleaners and a host of other adjuncts. By the end of the century, the Projects were completely self-sufficient, with food grown hydroponically in the sub-basements, separate floors set aside for schools and churches and factories, robot ore-sleds capable of seeking out raw materials unavailable within the Projects themselves and so on. And all because of, among other things, the population explosion.

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And the Treaty of Oslo.

It seems there was a power-struggle between two sets of then-existing nations (they were something like Projects, only horizontal instead of vertical) and both sets were equipped with atomic weapons. The Treaty of Oslo began by stating that atomic war was unthinkable, and added that just in case anyone happened to think of it only *tactical* atomic weapons could be used. No *strategic* atomic weapons. (A tactical weapon is something you use on the soldiers, and a strategic weapons is something you use on the folks at home.) Oddly enough, when somebody did think of the war, both sides adhered to the Treaty of Oslo, which meant that no Projects were bombed.

Of course, they made up for this as best they could by using tactical atomic weapons all over the place. After the war almost the whole world was quite dangerously radioactive. Except for the Projects. Or at least those of them which had in time installed the force screens which had been invented on the very eve of battle, and which deflected radioactive particles.

However, what with all of the *other* treaties which were broken during the Ungentlemanly Gentleman's War, by the time it was finished nobody was quite sure any more who was on whose side. That project over there on the horizon might be an ally. And then again it might not. Since they weren't sure either, it was risky to expose yourself in order to ask.

And so life went on, with little to remind us of the dangers lurking Outside. The basic policy of Eternal Vigilance and Instant Preparedness was left to the Army. The rest of us simply lived our lives and let it go at that.

BUT now there was a spy in the elevator.

When I thought of how deeply he had penetrated our defenses, and of how many others there might be, still penetrating, I shuddered. The walls were our safeguards only so long as all potential enemies were on the other side of them.

I sat shaken, digesting this news, until suddenly I remembered Linda.

I leaped to my feet, reading from my watch that it was now ten-fifteen. I dashed once more from the apartment and down the hall to the elevator, praying that the spy had been captured by now and that Linda would agree with me that a spy in the elevator was good and sufficient reason for me to be late.

He was still there. At least, the elevator was still out.

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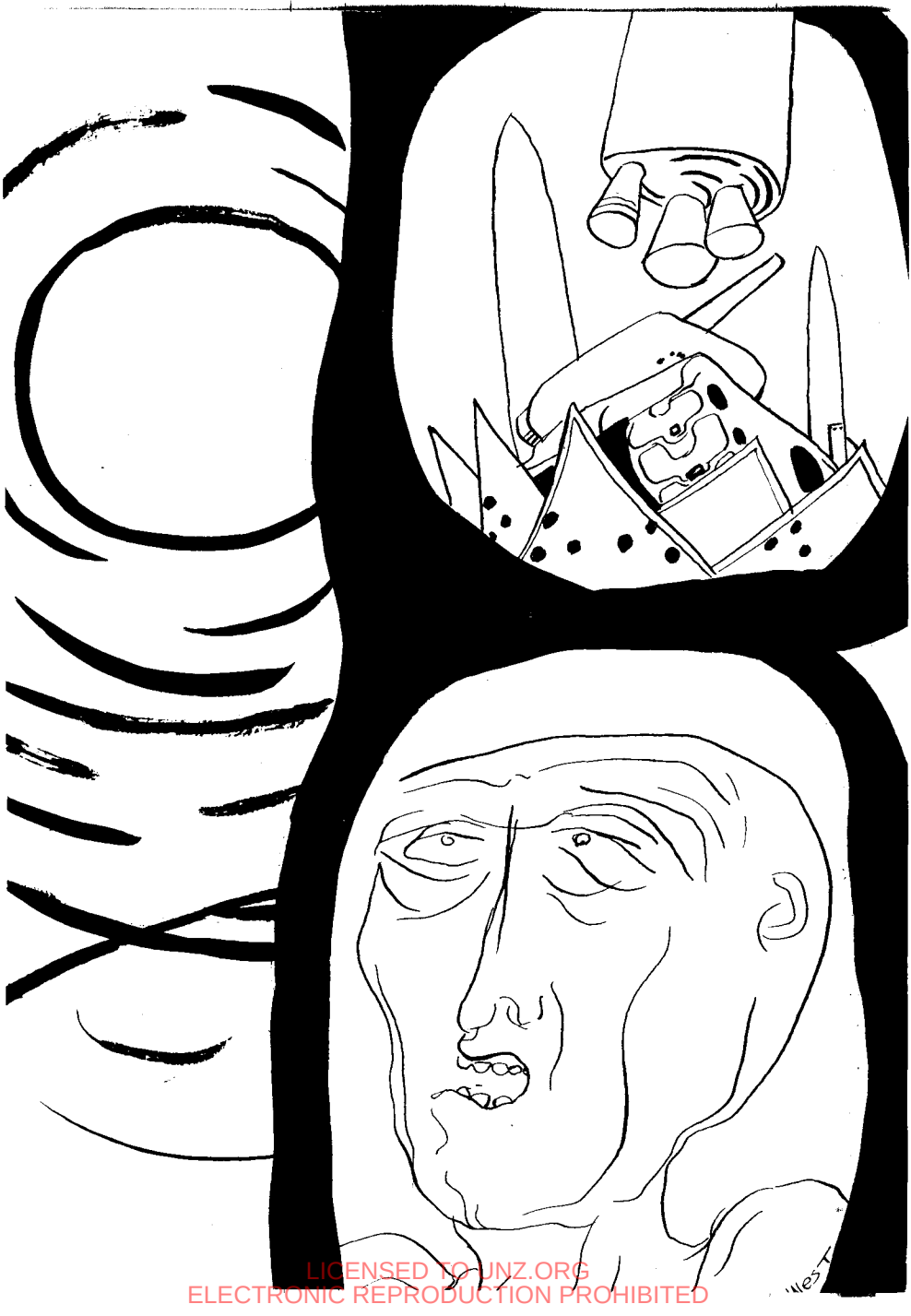

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I sagged against the wall, thinking dismal thoughts. Then I noticed the door to the right of the elevator. Through that door was the stairway.

I hadn't paid any attention to it before. No one ever uses the stairs except adventurous young boys playing cops and robbers, running up and down from landing to landing. I myself hadn't set foot on a flight of stairs since I was twelve years old.

Actually, the whole idea of stairs was ridiculous. We had elevators, didn't we? Usually, I mean, when they didn't contain spies. So what was the use of stairs?

Well, according to Dr. Kilbillie (a walking library of unnecessary information), the Project had been built when there still had been such things as municipal governments (something to do with cities, which were more or less grouped Projects), and the local municipal government had had on its books a fire ordinance, anachronistic even then, which required a complete set of stairs in every building constructed in the city. Ergo, the Project had stairs, thirty-two hundred of them.

And now, after all these years, the stairs might prove useful after all. It was only thirteen flights to Linda's floor. At sixteen steps a flight, that meant two hundred and eight steps.

Could I descend two hundred and eight steps for my true love? I could. If the door would open.

It would, though reluctantly. Who knew how many years it had been since last this door had been opened? It squeaked and wailed and groaned and finally opened half way. I stepped through to the musty, dusty landing, took a deep breath, and started down. Eight steps and a landing, eight steps and a floor. Eight steps and a landing, eight steps and a floor.

On the landing between one fifty and one forty-nine, there was a smallish door. I paused, looking curiously at it, and saw that at one time letters had been painted on it. The letters had long since flaked away, but they left a lighter residue of dust than that which covered the rest of the door. And so the words could still be read, if with difficulty.

I read them. They said:

EMERGENCY ENTRANCE
ELEVATOR SHAFT
AUTHORIZED PERSONNEL ONLY
KEEP LOCKED

I frowned, wondering immediately why this door wasn't being firmly guarded by at least a platoon of Army men. Half a dozen possible answers flashed through my mind. The more re-

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cent maps might simply have omitted this discarded and unnecessary door. It might be sealed shut on the other side. The Army might have caught be spy already. Somebody in authority might simply have goofed.

As I stood there, pondering these possibilities, the door opened and the spy came out, waving a gun.

III

HE COULDN'T have been anyone else but the spy. The gun, in the first place. The fact that he looked harried and upset and terribly nervous, in the second place. And, of course, the fact that he came from the elevator shaft.

Looking back, I think he must have been just as startled as I when we came face to face like that. We formed a brief tableau, both of us open-mouthed and wide-eyed.

Unfortunately, he recovered first.

He closed the emergency door behind him, quickly but quietly. His gun stopped waving around and instead pointed directly at my middle. "Don't move!" he whispered harshly. "Don't make a sound!"

I did exactly as I was told. I didn't move and I didn't make a sound. Which left me quite free to study him.

He was rather short, perhaps three inches shorter than me, with a bony high-cheekboned face featuring deepset eyes and a thin-lipped mouth. He wore gray slacks and shirt, with brown slippers on his feet. He looked exactly like a spy . . . which is to say that he *didn't* look like a spy, he looked overpoweringly ordinary. More than anything else, he reminded me of a rather taciturn milkman who used to make deliveries to my parents' apartment.

His gaze darted this way and that. Then he motioned with his free hand at the descending stairs and whispered, "Where do they go?"

I had to clear my throat before I could speak. "All the way down," I said.

"Good," he said — just as we both heard a sudden raucous squealing from perhaps four flights down, a squealing which could be nothing but the opening of a hall door. It was followed by the heavy thud of ascending boots. The Army!

But if I had any visions of imminent rescue, the spy dashed them. He said, "Where do you live?"

"One fifty-three," I said. This was a desperate and dangerous man. I knew my only slim chance of safety lay in answering his questions promptly, cooperating with him until and unless I saw

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a chance to either escape or capture him.

"All right," he whispered. "Go on." He prodded me with the gun.

And so we went back up the stairs to one fifty-three, and stopped at the door. He stood close behind me, the gun pressed against my back, and grated in my ear, "I'll have this gun in my pocket. If you make one false move I'll kill you. Now, we're going to your apartment. We're friends, just strolling along together. You got that?"

I nodded.

"All right. Let's go."

We went. I have never in my life seen that long hall quite so empty as it was right then. No one came out of any of the apartments, no one emerged from any of the branch halls. We walked to my apartment. I thumbed the door open and we went inside.

Once the door was closed behind us, he visibly relaxed, sagging against the door, his gun hand hanging limp at his side, a nervous smile playing across his lips.

I looked at him, judging the distance between us, wondering if I could leap at him before he could bring the gun up again. But he must have read my intentions on my face. He straightened, shaking his head. He said, "Don't try it. I don't want to kill you. I don't want to kill anybody, but I will if I have to. We'll just wait here together until the hue and cry passes us. Then I'll tie you up, so you won't be able to sic your Army on me too soon, and I'll leave. If you don't try any silly heroics, nothing will happen to you."

"You'll never get away," I told him. "The whole Project is alerted."

"You let me worry about that," he said. He licked his lips. "You got any chico coffee?"

"Yes."

"Make me a cup. And don't get any bright ideas about dousing me with boiling water."

"I only have my day's allotment," I protested. "Just enough for two cups, lunch and dinner."

"Two cups is fine," he said. "One for each of us."

AND NOW I had yet another grudge against this blasted spy. Which reminded me again of Linda. From the looks of things, I wasn't *ever* going to get to her place. By now she was probably in mourning for me and might even have the Sanitation Staff searching for my remains.

As I made the chico, he asked me questions. My name first, and then, "What do you do for a living?"

I thought fast. "I'm an ore-sled dispatcher," I said. That was a lie, of course, but I'd heard enough

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about ore-sled dispatching from Linda to be able to maintain the fiction should he question me further about it.

Actually, I was a gymnast instructor. The subjects I taught included wrestling, judo and karati — talents I would prefer to disclose to him in my own fashion, when the time came.

He was quiet for a moment. "What about radiation level on the ore-sleds?"

I had no idea what he was talking about, and admitted as much.

"When they come back," he said. "How much radiation do they pick up? Don't you people ever test them?"

"Of course not," I told him. I was on secure ground now, with Linda's information to guide me. "All radiation is cleared from the sleds and their cargo before they're brought into the building."

"I know that," he said impatiently. "But don't you ever check them before de-radiating them?"

"No. Why should we?"

"To find out how far the radiation level outside has dropped."

"For what? Who cares about that?"

He frowned bitterly. "The same answer," he muttered, more to himself than to me. "The same answer every time. You people have crawled into your caves and you're ready to stay in them forever."

I looked around at my apartment. "Rather a well-appointed cave," I told him.

"But a cave nevertheless." He leaned toward me, his eyes gleaming with a fanatical flame. "Don't you ever wish to get Outside?"

Incredible! I nearly poured boiling water all over myself. "Outside? Of course not!"

"The same thing," he grumbled, "over and over again. Always the same stupidity. Listen, you! Do you realize how long it took man to get out of the caves? The long slow painful creep of progress, for millenia, before he ever made that first step from the cave?"

"I have no idea," I told him.

"I'll tell you this," he said belligerently. "A lot longer than it took for him to turn around and go right back into the cave again." He started pacing the floor, waving the gun around in an agitated fashion as he talked. "Is this the *natural* life of man? It is not. Is this even a *desirable* life for man? It is *definitely* not." He spun back to face me, pointing the gun at me again, but this time he pointed it as though it were a finger, not a gun. "Listen, you," he snapped. "Man was progressing. For all his stupidities and excesses, he was growing up. His dreams were getting bigger and grander and better all the time. He was planning to

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tackle *space!* The moon first, and then the planets, and finally the stars. The whole universe was out there, waiting to be plucked like an apple from a tank. And Man was reaching out for it." He glared as though daring me to doubt it.

I DECIDED that this man was doubly dangerous. Not only was he a spy, he was also a lunatic. So I had two reasons for humoring him. I nodded politely.

"So what happened?" he demanded, and immediately answered himself. "I'll tell you what happened! Just as he was about to make that first giant step, Man got a hotfoot. That's all it was, just a little hotfoot. So what did Man do? I'll tell you what he did. He turned around and he ran all the way back to the cave he started from, his tail between his legs. *That's* what he did!"

To say that all of this was incomprehensible would be an extreme understatement. I fulfilled my obligation to this insane dialogue by saying, "Here's your coffee."

"Put it on the table," he said, switching instantly from raving maniac to watchful spy.

I put it on the table. He drank deep, then carried the cup across the room and sat down in my favorite chair. He studied me narrowly, and suddenly said, "What did they tell you I was? A spy?"

"Of course," I said.

He grinned bitterly, with one side of his mouth. "Of course. The damn fools! Spy! What do you suppose I'm going to spy on?"

He asked the question so violently and urgently that I knew I had to answer quickly and well, or the maniac would return. "I— I wouldn't know, exactly," I stammered. "Military equipment, I suppose."

"Military equipment? *What* military equipment? Your Army is supplied with uniforms, whistles and hand guns, and that's about it."

"The defenses —" I started.

"The defenses," he interrupted me, "are non-existent. If you mean the rocket launchers on the roof, they're rusted through with age. And what other defenses are there? None."

"If you say so," I replied stiffly. The Army claimed that we had adequate defense equipment. I chose to believe the Army over an enemy spy.

"Your people send out spies, too, don't they?" he demanded.

"Well, of course."

"And what are *they* supposed to spy on?"

"Well —" It was such a pointless question, it seemed silly to even answer it. "They're supposed to look for indications of an

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attack by one of the other projects."

"And do they find any indications, ever?"

"I'm sure I don't know," I told him frostily. "That would be classified information."

"You bet it would," he said, with malicious glee. "All right, if that's what *your* spies are doing, and if *I'm* a spy, then it follows that I'm doing the same thing, right?"

"I don't follow you," I admitted.

"If I'm a spy," he said impatiently, "then I'm supposed to look for indications of an attack by you people on my Project."

I shrugged. "If that's your job," I said, "then that's your job."

He got suddenly red-faced, and jumped to his feet. "That's *not* my job, you blatant idiot!" he shouted. "I'm not a spy! If I *were* a spy, *then* that would be my job!"

THE maniac had returned, in full force. "All right," I said hastily. "All right, whatever you say."

He glowered at me a moment longer, then shouted, "Bah!" and dropped back into the chair.

He breathed rather heavily for a while, glaring at the floor, then looked at me again. "All right, listen. What if I were to tell you that I *had* found indications that you people were planning to attack my Project?"

I stared at him. "That's impossible!" I cried. "We aren't planning to attack anybody! We just want to be left in peace!"

"How do I know that?" he demanded.

"It's the truth! What would we want to attack anybody for?"

"Ah hah!" He sat forward, tensed, pointing the gun at me like a finger again. "Now, then," he said. "If you know it doesn't make any sense for this Project to attack any other project, then why in the world should you think *they* might see some advantage in attacking *you?*"

I shook my head, dumbfounded. "I can't answer a question like that," I said. "How do I know what they're thinking?"

"They're human beings, aren't they?" he cried. "Like you? Like me? Like all the other people in this mausoleum?"

"Now, wait a minute—"

"No!" he shouted. "You wait a minute! I want to tell you something. You think I'm a spy. That blundering Army of yours thinks I'm a spy. That fathead who turned me in thinks I'm a spy. But I'm *not* a spy, and I'm going to tell you what I am."

I waited, looking as attentive as possible.

"I come," he said, "from a Project about eighty miles north of

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here. I came here by foot, without any sort of radiation shield at all to protect me."

The maniac was back. I didn't say a word. I didn't want to set off the violence that was so obviously in this lunatic.

"The radiation level," he went on, "is way down. It's practically as low as it was before the Atom War. I don't know how long it's been that low, but I would guess about ten years, at the very least." He leaned forward again, urgent and serious. "The world is safe out there now. Man can come back out of the cave again. He can start building the dreams again. And this time he can build better, because he has the horrible example of the recent past to guide him away from the pitfalls. There's no need any longer for the Projects."

And that was like saying there's no need any longer for stomachs, but I didn't say so. I didn't say anything at all.

"I'm a trained atomic engineer," he went on. "In my project, I worked on the reactor. Theoretically, I believed that there was a chance the radiation Outside was lessening by now, though we had no idea exactly how much radiation had been released by the Atom War. But I wanted to test the theory, and the Commission wouldn't let me. They claimed public safety, but I knew better. If the Outside were safe and the Projects were no longer needed, then the Commission was out of a job, and they knew it.

"WELL, I went ahead with the test anyway, and I was caught at it. For my punishment, I was banned from the Project. They kicked me out, telling me if I thought it was safe Outside I could live Outside. And if it really was safe, I could come back and tell them. Except that they also made it clear that I would be shot if I tried to get back in, because I would be carrying deadly radiation."

He smiled bitterly. "They had it all their own way," he said. "But it *is* safe out there, I'm living proof of it. I lived Outside for five months. And gradually I realized I had to tell others. I had to spread the word that Man could have his world back. I didn't dare try to get back into my own Project; I would have been recognized and shot before I could say a word. So I came here."

He paused to finish the cup of chico that I should have had with lunch. "I knew better," he continued, "than to simply walk into the building and announce that I came from Outside. Man has an instinctive distrust for strangers anyway; the Projects only intensify it. Once again, I

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would have been shot. So I've been working in a more devious way. I snuck into the Project — not a difficult thing for a man with no metal on his person, no radiation shield cocooning him — and for the last two months I've been wandering around the building, talking with people. I strike up a conversation. I try to plant a few seeds of doubt about the deadliness of Outside, and I hope that at least a few of the people I talk to will begin to wonder, as I once did."

Two months! This spy, by his own admission, had been in the Project two months before being detected. I'd never heard of such a thing, and I hoped I'd never hear of such a thing again.

"Things worked out pretty well," he said, "until today. I said something wrong — I'm still not sure what — and the man I was talking to hollered for Army, shouted I was a spy." He pounded the chair arm. "But I'm not a spy! And it's the truth, Outside is safe!" He glared suddenly at the window. "Why've you got that drape up there?"

"The window broke down," I explained. "It's stuck at transparent."

"Transparent? Fine!" He got up from the chair, strode across the room, and ripped the drape down from the window.

I cowered away from the sunglare, turning my back to the window.

"Come over here!" he shouted. When I didn't move, he snarled, "Get up and come over here, or I swear I'll shoot!"

And he would have, it was plain in his voice. I got to my feet, hesitant, and walked trembling to the window, squinting against the glare.

"Look out there," he ordered. "Look!"

I looked.

IV

TERROR. Horror. Dizziness and nausea.

Far and away and far, nothing and nothing. Only the glare, and the high blue, and the far far horizon, and the broken gray slag stretching out, way down below.

"Do you see?" he demanded. "Look down there! We're so high up, it's hard to see, but *look* for it. Do you see it? Do you see the green? Do you know what that means? There are green things growing again Outside! Not much yet. It's only just started back, but it's begun. The radiation is down. Plants are growing again."

The power of suggestion. And, of course, the heightened sensitivity caused by the double threat of a man beside me carrying a gun that yawning aching expanse of nothing beyond the window.

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I nearly fancied that I did see faint specks of green.

"Do you see it?" he asked me.

"Wait," I said. I leaned closer to the window, though every nerve in me wanted to leap the other way. "Yes!" I said. "Yes, I see it! Green!"

He sighed, a long painful sigh of thanksgiving. "Then now you know," he said. "I've been telling you the truth. It *is* safe Outside."

And my lie worked. For the first time, his guard was completely down.

I moved like a whirlwind. I leaped, and twisted his arm in a hard hammerlock, which caused him to cry out and drop the gun. That was wrestling. Then I turned and twisted and dipped, causing him to fly over my head and crash to the floor. That was judo. Then I jabbed one rigid forefinger against a certain spot on the side of his neck, causing the blood in his veins to forever stop its motion. That was karati.

WELL, by the time the Army men had finished questioning me, it was three o'clock in the afternoon, and I was five hours late. The Army men corroborated my belief that the man had been a spy, who had apparently lost his mind when cornered in the elevator. Outside was still dangerous, of course, they assured me of that. And he'd been lying about having been here two months. He'd been in the Project less than two days. Not only that, the Army men told me they'd found the radiation-proof car he'd driven, and in which he had hoped to drive back to his own Project once he'd discovered all our defenses.

Despite the fact that I had the most legitimate excuse for tardiness under the roof, Linda refused to forgive me for not making our ten o'clock meeting. When I asked her to marry me she refused, at length and descriptively.

But I was surprised and relieved to discover how rapidly I got over my heartbreak. This was aided by the fact that once the news of my exploit spread, there were any number of girls more than anxious to get to know me better, including the well-cleavaged young lady from the Transit Staff. After all, I was a hero. They even gave me a medal.

— DONALD E. WESTLAKE

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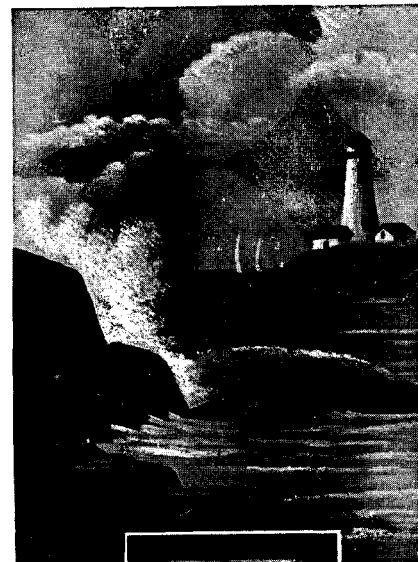

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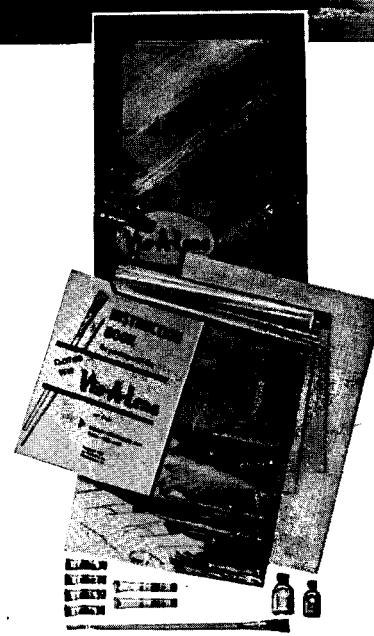

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